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FROM THE

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NEW AND EXTENSIVE
SAILING DIRECTIONS
FOR THE NAVIGATION OF
THE NORTH SEA,

COMPILED FROM
The latest and most approved Surveys.

SEVENTH EDITION,

Newly arranged and revised, including all the Alterations and Instructions
published to the present time; and considerably augmented and
improved by the communications of several

EXPERIENCED OFFICERS, PILOTS, AND COASTERS,

By J. S. HOBBS.

ORIGINALLY COMPILED BY

J. W. NORIE, HYDROGRAPHER,

AUTHOR OF A COMPLETE EPITOME OF PRACTICAL NAVIGATION, &c., &c.

Given to the
Massachusetts
Historical Society.

BY

Wm. Brewster Esq. Apr 28. 1864

NEW AND EXTENSIVE
Sailing Directions
FOR THE NAVIGATION OF
THE NORTH SEA;
CONTAINING
A full and accurate Description
OF
THE VARIOUS CHANNELS FROM THE NORE
TO ORFORDNESS;
WITH INSTRUCTIONS FOR SAILING INTO ALL THE BAYS, HARBOURS, AND
ROADSTEADS, ON THE EASTERN COASTS OF
ENGLAND & SCOTLAND,
FROM
THE TOWNS TO THE SHETLAND ISLANDS;
ALSO ON
THE OPPOSITE SHORES OF FRANCE,
THE NETHERLANDS, GERMANY, AND PART OF NORWAY,
FROM
Calais to the Scaw, Christiania, Bergen, and Drontheim.

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AUTHOR OF A COMPLETE EPITOME OF PRACTICAL NAVIGATION, ETC.

Seventh Edition,

NEWLY ARRANGED AND REVISED, FROM THE LATE APPROVED
ENGLISH, FRENCH, DUTCH, AND DANISH SURVEYS;
INCLUDING ALL THE

Alterations and Instructions made and published by order of the Honourable Corporation of Trinity House,
the Commissioners of the Northern Lighthouses, the Board of Trade at Hamburg, &c.

TO THE PRESENT TIME.

And considerably augmented and improved, by the
COMMUNICATIONS OF SEVERAL EXPERIENCED OFFICERS, PILOTS, AND COASTERS,
By J. S. HOBBS.

London :

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A List of the Lighthouses and Light-Vessels on the Coasts of Great Britain, &c., included in the North Sea, with the Pages where, in the following Work, they will be found in general more fully described.

NORE LIGHT-VESSEL is situated at the extremity of the Nore Sand, and exhibits one light, of great brilliancy, at night, and a red ball by day, serving to show the entrances to the Thames and Medway. Page 2.

MOUSE LIGHT-VESSEL is placed near the west end of the Mouse Sand, in 5 fathoms, and shows one bright light. In entering the Swin, it is to be left on the starboard hand. Page 5.

MAPLIN LIGHTHOUSE is erected on piles, near to the spit of the Maplin Sand, where the Sheers beacon formerly stood; and shows a single red light, which must always be left to the northward. Page 6.

SWIN MIDDLE LIGHT-VESSEL is moored in 4 fathoms, off the western end of the Swin Middle, and exhibits a revolving light. It is intended to direct vessels through the Swin, and is to be left on the east side. Page 6.

SUNK LIGHT-VESSEL lies off the eastern end of the Sunk Sand, and is intended to be a guide into and out of the King's Channel and Harwich. It exhibits one light only, and is to be left on the west side. Page 6.

SHIPWASH LIGHT-VESSEL is moored in 9 fathoms, off the N.E. end of the Shipwash Sand, to direct vessels through the Shipway Channel. Page 7.

CORK LEDGE LIGHT-VESSEL, off Harwich, is moored in $4\frac{1}{2}$ fathoms at low water, spring-tides, and shows a bright revolving light; and is intended as a guide for ships bound into Harwich harbour. Page 7.

HARWICH LIGHTHOUSES are two; the highest is of gray brick, 60 feet above the level of high water; the lower is white, and 27 feet only. Both show fixed lights, and when in a line, bear N.W. by N. Pages 12 to 15.

ORFORDNESS LIGHTHOUSES are two, the one higher than the other, and bearing fixed lights. They stand upon the beach at Orfordness, and bear, when in a line, N.E. by E. $\frac{1}{4}$ E. and S.W. by W. $\frac{1}{4}$ W. These serve to lead vessels clear of the Knapes, and through the inner channel, to Orfordness and Hollesley Bay, &c. Pages 11, 13, 17.

PAKEFIELD LIGHTHOUSE is erected near Pakefield, with a red fixed light, elevated 68 feet above the level of the sea. This light is intended to lead between the Barnard and Newcome Sands, into Lowestoff South Roads. Page 19.

LOWESTOFF LIGHTHOUSES are two; an inner higher light, and an outer lower light, of great utility in making the land, and guiding vessels into the Lowestoff South Roads. They are both fixed lights; and the lanterns are elevated 119 and 38 feet above the level of the sea. Page 19.

STANFORD LIGHT-VESSEL exhibits two lights, placed horizontally. This vessel has been removed from her former situation, and is now moored at the north end of the Newcome Sand, in a situation to lead vessels up from Yarmouth Roads, and to mark the eastern side of the northern entrance of the channel through Lowestoff South Roads. The Stanford Passage having become again navigable, the light is moored in such a situation as to serve for a guide through the new channel. Page 20.

ST. NICHOLAS LIGHT-VESSEL lies in 6 fathoms, near the south end of St. Nicholas Sand; and now serves as a guide for both the Hewett and the St. Nicholas Channel, and exhibits one bright light. Page 21.

The **GALLOPER LIGHT-VESSEL** rides near the southern end of the Galloper Sand, and is a guide to clear that sand and the Kentish Knock, &c. It bears two lights, placed horizontally on two separate masts. Page 24.

KENTISH KNOCK LIGHT-VESSEL is moored on the east side of the sand. The light is exhibited from a single lantern, and revolves, at an elevation of 38 feet above the level of the sea. Page 25.

The **GOODWIN LIGHT-VESSEL** lies off the North Sand Head, and exhibits three lights, forming an erect triangle, the middle light being most elevated. They are intended to lead clear of the north end of the Goodwin and into the Downs. Page 25.

NORTH FORELAND LIGHT is fixed, and situated upon the North Foreland; intended to direct vessels, coming from seaward, into the Downs, or Margate Roads.

[NORTH SEA.]

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The GULL STREAM LIGHT-VESSEL having two lights, placed horizontally, lies off the Trinity Swashway, and about $\frac{1}{4}$ of a mile from the Goodwin. Its intention is to guide ships through the Gull Stream.

NEWARP LIGHT-VESSEL lies off the north extremity of the Newarp Sand, and has three lights, the middle being the highest. Its principal utility is to direct ships into the Hasborough and Cockle Gats. Page 28.

COCKLE GAT LIGHT-VESSEL.—A floating light-vessel has been moored on the eastern side of the Cockle Gat, showing a bright revolving light, and moored in 7 fathoms at low water, spring-tides; and is intended as a guide to vessels proceeding through the Cockle Gat in the night. Page 28.

WINTERTON LIGHTHOUSE stands on the beach, and bears a fixed light; intended as a direction for the Cockle Gat and northern entrance to Yarmouth Roads. Page 29.

HASBOROUGH LIGHT-VESSEL exhibits two lanterns, with fixed lights, raised on separate masts, 37 feet high, and is moored off the northern extremity of the Hasborough Sand, in $13\frac{1}{2}$ fathoms at low water, spring-tides, with the words, "Hasbro' Light," painted on its sides. Page 30.

HASBOROUGH LIGHTHOUSES are two separate towers, one higher than the other, both having fixed lights, used in sailing in or out of Hasborough Gat, the leading mark being the two lights in one, bearing N.W. $\frac{1}{4}$ W. Page 32.

CROMER, or FOULNESS LIGHTHOUSE.—This has a revolving light, exhibiting a bright flash every 2 minutes. Page 33.

LEMAN and OWER LIGHT-VESSEL is placed between the Leman and Ower Sands, exhibiting two lights from lanterns placed on separate masts, the foremost of which revolves, while the aftermost is fixed. These are intended only as warning lights, in order to prevent vessels from approaching near these dangerous sands. A gun will also be fired from the light-vessel when any vessels are observed standing into danger; and during the day, a ball will be hoisted on the mizen-mast, in addition to the one on the foremast. Page 35.

DUDGEON LIGHT-VESSEL.—This vessel rides on the western side of the Dudgeon Bank, and exhibits one light. Page 37.

WELLS HARBOUR has small beacon-lights. Page 40.

HUNSTON, or HUNSTANTON LIGHTHOUSE, exhibits a fixed light, and stands on the beach at the entrance of Lynn Deep, into which it is a guide. This light will appear of a bright red colour when between the bearing of E.S.E. and S.E. by E., in the direction of the shoal, called the Roaring Middle. Pages 41, 45.

LYNN REGIS has two small harbour lights, of use to the pilots, showing the proper time for vessels to enter or depart from the harbour. There are also two tide-lights for the WISBEACH CHANNEL, one on each jetty-head, at the entrance of the new cut. Page 41.

LYNN WELL LIGHT-VESSEL is moored in $22\frac{1}{2}$ fathoms, and lies off the Hook of the Long Sand, carrying two lights, from separate lanterns, of equal heights. Page 41.

SPURN LIGHT-VESSEL lies off the entrance of the River Humber, and exhibits one revolving light, appearing every $\frac{1}{2}$ minute by night, and a red flag by day. A gong is kept sounding during dark and foggy weather. Page 48.

SPURN LIGHTHOUSES.—These are two, erected on the Spurn Head, bearing fixed lights, visible at a considerable distance. They are intended to direct ships into the Humber; and when in a line, bear N.W. $\frac{1}{4}$ N. Page 48.

BULL SAND LIGHT-VESSEL is moored off the S.E. end of the Bull Sand, in $4\frac{1}{2}$ fathoms at low water, about $\frac{1}{4}$ mile from the Spurn Point; and shows a bright light from a single lantern. Page 49.

KILLINGHOLME and PAULL LIGHTS.—Two lighthouses have lately been erected near the shore at Killingholme, showing two fixed lights, bearing from each other N.W. $\frac{1}{4}$ N. and S.E. $\frac{1}{4}$ S.; when brought in one, they lead vessels up the Humber. A fixed light is also shown at Paull; and a light-vessel, moored in 5 fathoms, on the south side of the Hebbles Channel, showing a fixed red light, and a red flag in the day-time. Page 50.

FLAMBOROUGH HEAD LIGHTHOUSE is erected within 400 yards of its extreme point. It is a revolving light, with three faces, one of which is red, and exhibits a face every 2 minutes. Page 55.

SCARBOROUGH LIGHTHOUSE is erected upon the pier, and is lighted from half-flood to half-ebb, being a tide-light only. There is also a tide-light shown at the new harbour. Page 56.

WHITBY HARBOUR.—There is a fixed light shown upon the western pier, on the star-board side of Whitby Harbour. It is a tide-light; and only exhibited while there are 8 feet water over the bar. Page 58.

RIVER TEES.—Two towers have been erected a short distance from Seaton Carew. The north-western tower shows a bright fixed light, and the south-eastern one a fixed red light; these, when brought in a line, clear the Salt Scar Rocks, and other dangers. Upon Bran Sand are two towers; the high, or southern one, showing a bright fixed light, and the lower, or outer one, a fixed red light. A light-vessel has also been moored in the river, near where the fifth buoy has hitherto laid, from which a bright light will be seen in all directions. Page 60.

HARTLEPOOL.—A lighthouse has been erected on the pier, exhibiting a red light, and is lit every evening from sun-set to day-break. A red flag is hoisted at half-flood, and continued till half-ebb. In addition to the red light, is one of a white colour below it; and two red lights are placed upon the dock walls, serving as a guide into the harbour. Page 60.

SEAHAM LIGHTHOUSE shows a fixed bright light, 100 feet above the mean level of the sea; and a lower lantern, showing a red revolving light, $\frac{1}{2}$ a minute visible, and $\frac{1}{2}$ a minute invisible, at all points where the top light is seen. It is 54 feet above the level of the sea. This light is easily distinguished from all other lights on this part of the coast. Page 61.

SUNDERLAND LIGHTHOUSE stands on the North Pier-Head, and is 64 feet high, bearing a bright fixed light, and 18 feet below it, another light, coloured red. There is also a tide-light on the South Pier, serving to show when there are 7 feet water over the bar; and in the day-time, a flag is hoisted on the North Pier for the same purpose. Page 61.

NORTH SHIELDS.—Here are two lighthouses, bearing bright fixed lights, which, when brought in a line, lead directly over the bar. Page 62.

TYNEMOUTH CASTLE LIGHT revolves, and shows a bright light every minute. Page 62.

BLYTHER HARBOUR has a fixed harbour light on the port or larboard side of the entrance, exhibited while there are 8 feet water over the bar. Page 63.

COQUET ISLAND LIGHTHOUSE.—The lighthouse on Coquet Island exhibits a bright fixed light, of great power, and which will be visible from N. by E. $\frac{1}{2}$ E. to S. by W. $\frac{1}{2}$ W. A light of inferior power will also be shown landward, in all directions. Page 63.

FARN ISLAND LIGHT revolves, and shows the full face of the reflector every $\frac{1}{2}$ minute. There is also another and lower lighthouse on the Farn Island, standing near its N.W. part. These lights bear S. by E. $\frac{1}{2}$ E. and N. by W. $\frac{1}{2}$ W. from each other. Page 69.

STAPLES, or LONGSTONE LIGHTHOUSE is situated on the Longstone, exhibiting a revolving light, and, like the high lighthouse on the Farn, shows the full face of the reflector every $\frac{1}{2}$ minute. Page 69.

BERWICK LIGHTHOUSE is erected upon the pier-head, and shows two fixed lights; the higher light is white, and exhibited throughout the night; the other is a red light, and only exhibited while there are 10 feet water over the bar. Page 77.

EYEMOUTH HARBOUR LIGHTS are erected for the benefit of the fishermen frequenting the Port of Eyemouth during the herring season. The brightest of the two lights is about 26 feet from the ground, and is seen at a distance of more than 6 miles. The smaller light is placed on the pier-head, and affords a leading mark, when the lights are brought in one line, for the best passage into Eyemouth Bay. Page 79.

MAY ISLAND LIGHTHOUSE exhibits a bright fixed light from lamps, with reflectors. It forms a very conspicuous object, and serves to point out the entrance to the Frith of Forth. Page 82.

ISLE OF MAY LEADING LIGHT.—This light is fixed, and of the natural appearance; and is placed on a tower, about 130 feet below the level of the present light, and N.E. by N. of it. When in one line, seen distinctly one above the other, they bear S.W. by S. $\frac{1}{2}$ S. and N.E. by N. $\frac{1}{2}$ N.; and lead $\frac{1}{2}$ a mile eastward of the North Carr Rock. The lights must, on no account, be opened to the westward. Page 82.

INCH KEITH LIGHTHOUSE shows a revolving light, producing bright flashes once every minute, then gradually lessening its brilliancy, until it nearly disappears, but not totally, when within 4 or 5 miles; thus it cannot be mistaken for any other light on this coast, and is particularly calculated to assist the mariner in navigating the channels to and from Leith Roads, &c. Page 82.

LEITH has two harbour-lights, shown while there are 9 feet water over the bar. The old one exhibits a bright fixed light, 10 feet above the level of high water; and one of a red colour, placed at the end of the pier. Page 84.

NEW HAVEN has a small fixed light of a red colour, intended principally for the use of the passage boats. Page 84.

QUEENSFERRY has a fixed light for the use of the ferry-boats. Page 85.

KINGHORN has a bright fixed light, shown while there are 8 feet water in the harbour. Page 85.

BURNT ISLAND has a similar light, which is lighted throughout the night. Page 85.

BELL ROCK LIGHTHOUSE.—The light is 115 feet from the level of the sea at low water, and made to revolve horizontally, completing its revolution in the space of 2 minutes, and showing a red and a bright light alternately. A bell is sounded by machinery every $\frac{1}{2}$ minute in foggy weather, to warn mariners of their approaching danger. Page 90.

BUTTON NESS LIGHTHOUSES both show bright fixed lights, and are situated upon the northern shore of the River Tay, and lead to the fairway buoy. There are also two tide-lights at South Ferry Ness; a red light on the east pier, and a bright light on the middle pier at Dundee; also a fixed light at the Craig Pier, for the use of the ferry-boats; and at Newport are two lights. Page 91.

ARBROATH has a small red light, placed on the starboard side of the entrance, for the pilots of the place. Page 92.

MONTROSE LIGHTS.—These are harbour lights of a red colour, and when brought in one, bear nearly W.N.W. Page 94.

STONEHAVEN.—Two fixed lights on the pier, 20 feet above high-water mark. The seaward, or lower light, bright; the landward, or upper light, red, N.W. $\frac{3}{4}$ W. and S.E. $\frac{3}{4}$ E. Page 94.

GIRDLENESS has a lighthouse, exhibiting two bright fixed lights, one above the other; but, at a distance, they appear as one, of an elongated form. Page 95.

ABERDEEN has a fixed tide-light placed on the north pier-head, while there are 9 feet water over the bar. Page 95.

LIGHTS OF ABERDEEN HARBOUR.—The two leading lights, established for the safer guidance of vessels entering this port, are exhibited from sun-set to sun-rise, and have no reference whatever to the state of the tides. The lights are of a brilliant red colour, one above the other, and are elevated, the one about 30 feet, and the other about 47 feet, respectively, above high water spring-tides, visible, in clear weather, at the distance of 5 or 6 miles. When seen in a line W. by S. $\frac{1}{4}$ S., nearly, if the depth of water permits, vessels may run for the harbour with safety. Page 95.

BUCHAN NESS has a lighthouse, 130 feet above the level of the sea, showing a bright flashing or twinkling light every 5 seconds. Page 98.

KINNAIRD'S HEAD LIGHTHOUSE bears a bright fixed light, and may be seen, in clear weather, 5 leagues off. Page 100.

CRAIGHEAD LIGHTHOUSE.—The new lighthouse on Craighead exhibits a revolving light, 160 feet above the level of the sea, and may be seen a considerable distance along the coast. From W. by N. $\frac{1}{4}$ N. to S.E. by E. $\frac{1}{4}$ E. the light is of a natural appearance; but from S.E. by E. $\frac{1}{4}$ E. to S.E. $\frac{1}{4}$ S. it will be coloured red, and revolves once a minute. Page 100.

CROMARTY POINT LIGHTHOUSE.—This is a fixed red light, open from W.N.W. round to S.E. by E. $\frac{1}{4}$ S. in a northerly direction; visible, in clear weather, 9 miles. Page 100.

CHANONRY POINT LIGHT is situated at the entrance of the Frith, leading to Inverness and the Caledonian Canal. This is a fixed light, of the natural colour, open from W. $\frac{1}{2}$ N. to N. by E., in a southerly direction. Page 101.

TARBET NESS has a lighthouse, showing a revolving or intermittent light, visible 5 or 6 leagues. Page 102.

PENTLAND SKERRIES LIGHTS.—There are two lighthouses erected upon the Great Skerry, bearing from each other N.N.E. and S.S.W., and point out the entrance to Pentland Frith. These both show fixed lights. Page 105.

DUNNET HEAD LIGHTHOUSE has its lantern elevated 346 feet above the level of the sea. It shows a fixed light, and may be seen 8 leagues off in clear weather. Page 105.

CAPE WRATH LIGHTHOUSE bears a revolving light, elevated 400 feet above the level of the sea, showing a bright and red light alternately. Page 106.

START POINT LIGHTHOUSE, on the Isle of Sanda, one of the Orkneys, exhibits a bright revolving light, distinguished from all others by its being seen during 1 minute, and disappearing the next. Page 107.

KIRKWALL.—A fixed light on the pier-head, in latitude $59^{\circ} 0'$ north, and longitude $2^{\circ} 58'$ west; shown all night from August to April. Page 108.

SUMBURGH HEAD LIGHTHOUSE stands on the S.E. part of the Shetlands, elevated 300 feet above the level of the sea, and shows a fixed light, visible 6 or 7 leagues in fair weather. Page 114.

Lighthouses and Light-Vessels on the Coasts of France, Holland, Germany, and Norway.

GRISNEZ LIGHTHOUSE is erected on the Cape, exhibiting a revolving light of the first order, every 30 seconds; and may be seen, in clear weather, 8 leagues. Page 129.

CALAIS has a lighthouse, which shows a bright revolving light, and makes its circuit in $1\frac{1}{2}$ minute. There is also a tide-light on Fort Rouge.

The western jetty-head of Calais Harbour has been recently extended 269 yards, and a small fixed light is now exhibited thereon, visible at 3 miles distance; but, in bad weather, it may be impossible to approach the extreme end of the jetty, and, in that case, it will not be lighted.

This light was first lighted and extinguished at the same as the tide-light on Fort Rouge; but since the 1st of May, 1842, it was to continue all night. Page 129.

GRAVELINES.—A fixed light, in latitude $51^{\circ} 0' 18''$ north, and longitude $2^{\circ} 6' 48''$ east to the eastward of the pier-head, at the entrance of the harbour. The building is 83 feet, and the height of the light 95 feet, visible 5 leagues. There are also 2 tide-lights. Page 130.

DUNKIRK has a revolving light on the head of the pier, between the harbour and Fort Risban, and 1530 yards in a N.W. direction from Heuguenar Tower. The light is 193 feet above the level of the sea, and visible 6 leagues in clear weather; and also a tide-light placed upon the western jetty-head. Page 131.

NIEUPORT has a beacon, castle, and a lighthouse; also a tide-light, lighted only when the tide allows vessels to enter. Page 131.

OSTEND has a high lighthouse, showing a fixed light, situated near the end of the western jetty, 80 feet above high water mark; and also 2 tide-lights, placed on the eastern jetty. Page 131.

BLANKENBURG LIGHT is fixed 30 feet high; is shown from sun-set to sun-rise. Page 143.

HEYST LIGHT is a fixed red light, established on the sand-hills to the northward of the town. The light is elevated 48 feet above the level of high water, visible from seaward between the bearings of east, round to W. by S. Page 143.

Lights on the Coast of Holland.

FLUSHING LIGHT.—A fixed lenticular lamp-light, of the fourth size, placed on a wooden eminence on the west harbour bulwark, 49 feet above high water mark; is visible 10 or 12 miles from E.S.E., round south, to N. by W. Page 144.

WEST KAPELLE COAST LIGHT.—A fixed light, of 15 argand lamps, with reflectors, is placed on the steeple of the old church, $144\frac{1}{2}$ feet above high water mark; is visible 14 or 15 miles, and illuminates the horizon all but from E.S.E. to N.E. Page 144.

MIDDLEBURG HARBOUR LIGHT.—Interior and shore light in the Sloe, on the Sand-creek and south of Middleburg new harbour.—A common lamp-light, fixed, is placed on a wooden eminence erected on the Dyke, south of Middleburg Harbour. It is 32 feet above high water mark, and visible 3 miles, from S.S.E., through east, to north. Page 144.

VEERE SHORE LIGHT is fixed, and placed in front of the tower, called Camp Veer steeple, south of, and near the entrance of Veere Harbour. It is raised 38 feet above high water mark, and visible 5 miles, from N. by E., through east, to S. by W. Page 144.

ZIERICKZEE LIGHT is stationary. A common lamp (fixed) placed on a house, on the west pier of Zierickzee Harbour, 42 feet above high water mark, visible 5 or 6 miles. Page 145.

SCHOUWEN COAST LIGHT (revolving).—A lenticular light of the first order, 170 feet above high water mark; visible 20 miles in every direction, and will appear 25 seconds in every $1\frac{1}{2}$ minute; its greatest brilliancy will last 10 seconds. Page 145.

HELLEVOET SLUYS COAST AND HARBOUR LIGHT (stationary).—A fixed argand lamp light, composed of three lamps, having reflectors, is placed on a tower built for the purpose, on the west pier of Hellevoet Harbour. The light is 46 feet above high water mark, visible 8 miles from S.E., round by south, to N.W. Page 145.

GOEREE COAST LIGHT, on the north battery (stationary).—A fixed lenticular lamp light, of the fourth size, is placed on a wooden structure, 72 feet above high water mark; visible 10 or 12 miles, from east, round by north, to W.S.W. Page 145.

GOEREE LIGHT.—A fixed lenticular lamp, of the second size, is placed on the church steeple, $147\frac{1}{2}$ feet above high water mark, visible at the distance of 5 leagues, from the S.W., round to the northward, and to S.E. Page 145.

BRIEL LIGHT (stationary).—A common lamp-light (fixed) is placed on the town steeple,

203 feet above high water mark, visible 7 miles from N.E. by N., through north, to west. Page 145.

BRIEL HARBOUR-LIGHT is fixed, and placed on a lantern-post on the east pier, 16 feet above high water, visible 4 miles from S.E., through east, to N.N.W.—N.B. This light only burns during moonless nights. Page 146.

OOSTVOORN COAST-LIGHT (fixed).—A common light, composed of 2 argand lamps, and 2 parabolic reflectors, one lamp in line with the channel over Briel bar, and bearing N. by W.; the second in line with the new channel called Spleet, and bearing N.W. by W. This light is placed on an eminence on the downs, near Oostvoorn, 14 feet above high water mark, visible 3 miles. Page 146.

SCHEVENINGEN COAST LIGHT.—A fixed argand lamp light, of 3 lamps, with reflectors, is placed on a stone tower erected on the downs, southward of the village, and near the beach, 75 feet above high water mark, and visible 6 miles from north to west. Page 160.

The **COAST-LIGHTS** of **KATWYCK**, **NOORDWYCK**, and **ZANDVOORT**, only burn when the fishing-boats are out. Page 160.

EGMOND-OP-ZEE COAST-LIGHT.—Two fixed lenticular lamps, of the third size. These lights are placed in 2 towers erected on the downs, bearing S.S.E. $\frac{1}{2}$ E. and N.N.W. $\frac{1}{2}$ W. of each other. The southern light is most elevated. They may be seen 6 leagues from N. by E., through north and south, to S.S.W. Page 160.

KYCKDUIN COAST-LIGHT (stationary).—This light is placed on a tower erected for the purpose, on the downs, in Fort Kyckduin, in latitude $52^{\circ} 27' 4''$ north, and longitude $4^{\circ} 43' 3''$ east of Greenwich. It is placed 154 feet above high water mark, visible 16 miles, and illuminates the horizon entirely. Page 161.

VLIELAND COAST-LIGHT (stationary).—This light is placed on a stone eminence erected on the downs, to the westward of the village, in latitude $53^{\circ} 17' 47''$ north, and longitude $5^{\circ} 3' 45''$ east, 150 feet above high water mark, is visible 12 miles, and illuminates the horizon except to the S.W. Page 165.

TERSCHELLING COAST-LIGHT (revolving).—At the distance of 16 miles, this light is not visible, during 14 to 15 seconds in every minute; the greatest brilliancy continues for 6 seconds. This light is placed on a tower, called the Brandaris, on the west coast of the island, in latitude $53^{\circ} 21' 40''$ north, and longitude $5^{\circ} 13' 7''$ east, is visible 20 miles, and illuminates the horizon entirely. Page 165.

BORKUM LIGHTHOUSE is 150 feet above the level of the sea, and is illuminated with lamps and reflectors, serving to show the entrances to the Ems. Page 167..

WANGER OOG LIGHTHOUSE bears an intermitting light, alternately visible and invisible every minute. Page 170.

HELIGOLAND LIGHTHOUSE is elevated 250-feet above the level of the sea, and bears a fixed light, forming a conspicuous and useful object for vessels bound to the Elbe, Weser, and adjacent rivers. Pages 170.

LIGHT-VESSELS are commonly stationed at the entrances of the Elbe, Weser, and Eyder. In day-time, the two light-vessels at the Weser are distinguished by a ball at the mast-heads; the others by a red flag flying at the top-mast; and at night, by a lantern, which, in clear weather, will be visible 3 miles off. Pages 171, 175, 181.

NIEUWERK LIGHTS are erected on a small island at the southern entrance to the Elbe, and are fixed, one being much higher than the other. There are also several beacons. Pages 177, 180.

CUXHAVEN has a stationary light. Page 180.

HANTSHOLMS LIGHT, N.W. coast of Jutland.—A reverberatory lentil light is placed on the Hantsholms, in latitude $57^{\circ} 6' 50''$ north, and longitude $8^{\circ} 36' 15''$ east; the light is 212 feet above the level of the sea. This light will show a flash, of 15 seconds' duration, every $\frac{1}{2}$ minute. Page 185.

The **SCAW LIGHTHOUSE** bears a fixed bright light, 67 feet high, and is kept white, forming a prominent object for sailing into the Cattagat. Page 186.

Lighthouses on the Coast of Norway.

LINDERSNAES, or the **NAZE**.—On this point is a lighthouse, painted white, and bearing two lights, forming a distinguishing mark for making this coast. Page 187.

OXOE ISLAND (entrance to Christiansand) has a light, varied by bright flashes, appearing every 4 minutes, exhibited 135 feet above the surface of the sea. The lighthouse is painted white, and serves as a sea-mark by day. There is also a harbour-light placed on Oderoe Island. Page 189.

ARENDAHL LIGHTS.—Two fixed lights are placed on Great and Little Torungen Islands, at the entrance of Arendahl, visible from 18 to 20 miles. A fixed light is placed on Sandvigssoden Island, on the western side of the channel to Arendahl, visible from 10 to 12 miles. Page 188.

JOMFRULAND has a lighthouse, 130 feet high, with a revolving light, which shows a bright flash every $\frac{1}{2}$ minute, and is then darkened, but not totally eclipsed within the distance of 8 miles: the flash will be visible 18 or 20 miles off. Page 188.

LANGOESUND has a fixed light, situated on the west side of the entrance to Langoesund Fiord. Page 192.

FÆRDER ISLAND has a lighthouse upon it, 224 feet above the level of the sea, serving to point out the entrance to Christiania Sound; this shows a steady fixed light. Page 192.

FUGLEHUK ROCK is situated to the northward of Færder Island, and has a revolving light upon it, to facilitate the navigation to Dram and Christiania. Page 192.

Christiania Fiord Lights.

BASTO ISLAND LIGHT is fixed, 28 feet high. Page 192.

RODTANGEN is a fixed light, 35 feet high, at the entrance of Dram Fiord. Page 192.

FILVET LIGHT is fixed, 24 feet high. Page 192.

STELLENES is a fixed light, 22 feet high. Page 192.

HOEGHOLMEN is a fixed harbour-light, near Christiania. Page 193.

LISTER, or GUNNARSHOUG POINT, has a lighthouse, bearing a revolving light, 125 feet above the level of the sea, which exhibits a bright flash every minute, during 12 seconds; after which it becomes fainter. Page 193.

On **WARNES POINT** is a lighthouse, showing a fixed light, visible 6 miles off. Page 193.

On **HUIDDINGS-OE, or ISLAND**, is a lighthouse, showing a fixed light, for the guiding vessels into Bukke Fiord and Carm Sound. Page 194.

At **TUNGENESS**, about 6 miles S.E. of Huiddings-Oe, is a small fixed harbour-light, 24 feet high. Page 194.

At **HOIVARDE, in CARM SOUND**, is a fixed harbour-light, 63 feet high. Page 194.

SKUDESNESS LIGHTHOUSE shows a fixed light, conducting the mariner to the entrance of Carm Sound. Page 194.

UDSIRE LIGHTS.—Two fixed lights are now placed on the island of Udsire, in latitude $59^{\circ} 18'$ north, and longitude $4^{\circ} 53' 30''$ east. These two lights can be seen from every side, and bear from each other S. 68° E., and N. 68° W., by true compass. Page 194.

RONDOE.—The northern point of this island has a lighthouse, bearing a fixed light, from the 15th August to the 30th April. Page 197.

VALDERHAUG LIGHT, in Breedt Sound.—This is a fixed harbour-light, 40 feet high. Page 197.

Lights at Christian Sund.

QUITHOLMEN LIGHT is revolving, which every minute throws out a light, of 10 or 12 seconds' duration, and is followed by an eclipse, though not a total one. It is visible from 18 to 20 miles, in the direction of S.S.W. $\frac{3}{4}$ W., though west, north, and east, to S.S.E. $\frac{3}{4}$ E., is in latitude $63^{\circ} 1' 15''$ north, and longitude $7^{\circ} 12' 15''$ east, elevated 130 feet above the level of the sea. Page 197.

STAVENESS LIGHT is fixed, and visible from N.W. by W. $\frac{3}{4}$ W. through north and east, to S.E. It is in latitude $63^{\circ} 7'$ north, and longitude $7^{\circ} 39' 6''$ east of Greenwich; is 63 feet above the level of the sea, the building painted of a bright colour. Both lights will burn from the 15th of August to the 30th of April. Page 198.

Lights in Drontheim Fiord.

TYRHOUG LIGHT, at Eddo Island, is fixed, and is 35 feet high. Page 198.

TERNINGEN LIGHT is fixed, 35 feet high. Page 198.

AGDANESS POINT LIGHT is fixed, 113 feet in height. Page 199.

MONKHOLMEN LIGHT is the harbour-light near Drontheim, 43 feet high. Page 199.

PRAESTOE LIGHT is fixed, and situated in latitude $64^{\circ} 27' 26''$ north, and longitude $11^{\circ} 8'$ east; is elevated 33 feet above the level of the sea, and visible at the distance of 10 miles. This light is in the Gulf of Folden (Province of Drontheim). Page 199.

A USEFUL TABLE FOR FINDING THE DISTANCE OF AN OBJECT BY TWO BEARINGS, AND THE DISTANCE RUN BETWEEN THEM.

Difference between the Course and Second Bearing in Points of the Compass.

Difference between the Course and First Bearing in Points of the Compass.

| Pts. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Pts. | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 2 | 1.00 | 0.89 | 0.81 | 0.74 | 0.69 | 0.64 | 0.60 | 0.57 | 0.54 | 0.52 | 0.49 | 0.48 | 0.46 | 0.45 | 0.43 | 0.42 | 0.41 | 0.40 | 0.39 | 0.38 | 0.38 | 0.38 | 0.39 | 0.40 | 0.41 | 0.42 | 0.43 | 0.45 |
| 3 | 1.12 | 1.00 | 0.91 | 0.83 | 0.77 | 0.72 | 0.67 | 0.64 | 0.60 | 0.58 | 0.55 | 0.53 | 0.51 | 0.50 | 0.48 | 0.47 | 0.46 | 0.45 | 0.44 | 0.43 | 0.43 | 0.43 | 0.44 | 0.45 | 0.46 | 0.47 | 0.48 | 0.49 |
| 4 | 1.23 | 1.10 | 1.00 | 0.92 | 0.85 | 0.79 | 0.74 | 0.70 | 0.67 | 0.64 | 0.61 | 0.59 | 0.57 | 0.55 | 0.53 | 0.51 | 0.50 | 0.49 | 0.48 | 0.47 | 0.47 | 0.47 | 0.48 | 0.49 | 0.50 | 0.51 | 0.52 | 0.53 |
| 5 | 1.34 | 1.20 | 1.09 | 1.00 | 0.93 | 0.86 | 0.81 | 0.77 | 0.73 | 0.69 | 0.67 | 0.64 | 0.62 | 0.60 | 0.58 | 0.56 | 0.55 | 0.54 | 0.53 | 0.53 | 0.53 | 0.53 | 0.54 | 0.55 | 0.56 | 0.57 | 0.58 | 0.59 |
| 6 | 1.45 | 1.30 | 1.17 | 1.08 | 1.00 | 0.93 | 0.88 | 0.83 | 0.79 | 0.75 | 0.72 | 0.69 | 0.67 | 0.65 | 0.63 | 0.61 | 0.60 | 0.59 | 0.58 | 0.57 | 0.57 | 0.57 | 0.58 | 0.59 | 0.60 | 0.61 | 0.62 | 0.63 |
| 7 | 1.56 | 1.39 | 1.25 | 1.16 | 1.07 | 1.00 | 0.94 | 0.89 | 0.84 | 0.80 | 0.77 | 0.74 | 0.72 | 0.69 | 0.67 | 0.65 | 0.64 | 0.63 | 0.62 | 0.61 | 0.60 | 0.60 | 0.60 | 0.61 | 0.62 | 0.63 | 0.64 | 0.65 |
| 8 | 1.68 | 1.48 | 1.35 | 1.23 | 1.14 | 1.07 | 1.00 | 0.94 | 0.90 | 0.86 | 0.82 | 0.79 | 0.76 | 0.74 | 0.72 | 0.70 | 0.69 | 0.68 | 0.67 | 0.66 | 0.65 | 0.64 | 0.64 | 0.64 | 0.65 | 0.66 | 0.67 | 0.68 |
| 9 | 1.76 | 1.57 | 1.42 | 1.31 | 1.21 | 1.13 | 1.06 | 1.00 | 0.95 | 0.91 | 0.87 | 0.84 | 0.81 | 0.78 | 0.76 | 0.74 | 0.73 | 0.72 | 0.71 | 0.70 | 0.69 | 0.68 | 0.68 | 0.68 | 0.69 | 0.70 | 0.71 | 0.72 |
| 10 | 1.85 | 1.65 | 1.50 | 1.37 | 1.27 | 1.19 | 1.11 | 1.05 | 1.00 | 0.95 | 0.90 | 0.86 | 0.82 | 0.79 | 0.76 | 0.74 | 0.73 | 0.72 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 | 0.72 | 0.73 | 0.74 |
| 11 | 1.94 | 1.73 | 1.57 | 1.44 | 1.33 | 1.24 | 1.17 | 1.10 | 1.05 | 1.00 | 0.95 | 0.90 | 0.86 | 0.82 | 0.79 | 0.76 | 0.74 | 0.73 | 0.72 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 | 0.71 | 0.72 | 0.73 | 0.74 |
| 12 | 2.02 | 1.81 | 1.64 | 1.50 | 1.39 | 1.30 | 1.22 | 1.15 | 1.09 | 1.04 | 0.99 | 0.93 | 0.88 | 0.84 | 0.80 | 0.77 | 0.75 | 0.74 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.74 | 0.75 | 0.76 |
| 13 | 2.10 | 1.88 | 1.70 | 1.56 | 1.45 | 1.35 | 1.27 | 1.20 | 1.14 | 1.08 | 1.04 | 0.99 | 0.93 | 0.88 | 0.84 | 0.80 | 0.77 | 0.75 | 0.74 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.74 | 0.75 | 0.76 |
| 14 | 2.17 | 1.94 | 1.77 | 1.63 | 1.50 | 1.40 | 1.31 | 1.24 | 1.18 | 1.13 | 1.08 | 1.04 | 0.99 | 0.93 | 0.88 | 0.84 | 0.80 | 0.77 | 0.75 | 0.74 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.74 | 0.75 | 0.76 |
| 15 | 2.24 | 2.01 | 1.82 | 1.67 | 1.54 | 1.44 | 1.35 | 1.28 | 1.21 | 1.16 | 1.11 | 1.07 | 1.03 | 0.98 | 0.93 | 0.89 | 0.85 | 0.81 | 0.78 | 0.76 | 0.75 | 0.74 | 0.73 | 0.73 | 0.73 | 0.74 | 0.75 | 0.76 |
| 16 | 2.30 | 2.06 | 1.87 | 1.71 | 1.58 | 1.48 | 1.39 | 1.31 | 1.25 | 1.19 | 1.14 | 1.10 | 1.06 | 1.02 | 0.97 | 0.93 | 0.89 | 0.85 | 0.81 | 0.78 | 0.76 | 0.75 | 0.74 | 0.73 | 0.73 | 0.74 | 0.75 | 0.76 |
| 17 | 2.36 | 2.11 | 1.92 | 1.75 | 1.63 | 1.52 | 1.43 | 1.35 | 1.28 | 1.22 | 1.17 | 1.12 | 1.08 | 1.04 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.75 | 0.74 | 0.73 | 0.73 | 0.74 | 0.75 | 0.76 |
| 18 | 2.41 | 2.16 | 1.96 | 1.80 | 1.66 | 1.55 | 1.46 | 1.38 | 1.31 | 1.25 | 1.19 | 1.15 | 1.11 | 1.08 | 1.05 | 1.02 | 0.98 | 0.94 | 0.90 | 0.87 | 0.83 | 0.80 | 0.77 | 0.75 | 0.74 | 0.75 | 0.76 | 0.77 |
| 19 | 2.46 | 2.20 | 2.00 | 1.83 | 1.69 | 1.58 | 1.48 | 1.40 | 1.33 | 1.27 | 1.22 | 1.17 | 1.13 | 1.10 | 1.07 | 1.04 | 1.02 | 0.98 | 0.94 | 0.90 | 0.87 | 0.83 | 0.80 | 0.77 | 0.75 | 0.74 | 0.75 | 0.76 |
| 20 | 2.50 | 2.24 | 2.03 | 1.86 | 1.72 | 1.61 | 1.51 | 1.42 | 1.35 | 1.29 | 1.24 | 1.19 | 1.15 | 1.11 | 1.08 | 1.06 | 1.03 | 1.00 | 0.98 | 0.94 | 0.90 | 0.87 | 0.83 | 0.80 | 0.77 | 0.75 | 0.74 | 0.75 |
| 21 | 2.53 | 2.27 | 2.06 | 1.89 | 1.75 | 1.63 | 1.53 | 1.44 | 1.37 | 1.31 | 1.25 | 1.21 | 1.17 | 1.13 | 1.10 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.75 | 0.74 | 0.75 |
| 22 | 2.56 | 2.29 | 2.08 | 1.91 | 1.76 | 1.65 | 1.55 | 1.46 | 1.39 | 1.32 | 1.27 | 1.22 | 1.18 | 1.14 | 1.11 | 1.09 | 1.06 | 1.03 | 1.00 | 0.97 | 0.93 | 0.89 | 0.85 | 0.81 | 0.78 | 0.76 | 0.75 | 0.76 |
| 23 | 2.59 | 2.31 | 2.10 | 1.92 | 1.78 | 1.66 | 1.57 | 1.47 | 1.40 | 1.34 | 1.28 | 1.23 | 1.19 | 1.15 | 1.12 | 1.10 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.75 | 0.76 |
| 24 | 2.60 | 2.32 | 2.11 | 1.93 | 1.79 | 1.67 | 1.57 | 1.48 | 1.41 | 1.35 | 1.29 | 1.24 | 1.20 | 1.16 | 1.13 | 1.11 | 1.08 | 1.06 | 1.03 | 1.00 | 0.97 | 0.93 | 0.89 | 0.85 | 0.81 | 0.78 | 0.76 | 0.77 |
| 25 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 26 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 27 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 28 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 29 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 30 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 31 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 32 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 33 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 34 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 35 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 36 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 37 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 38 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 39 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 40 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 41 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 42 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 43 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.78 |
| 44 | 2.61 | 2.34 | 2.12 | 1.94 | 1.80 | 1.68 | 1.58 | 1.49 | 1.42 | 1.36 | 1.30 | 1.25 | 1.21 | 1.17 | 1.14 | 1.12 | 1.09 | 1.07 | 1.05 | 1.02 | 0.99 | 0.95 | 0.91 | 0.87 | 0.84 | 0.80 | 0.77 | 0.7 |

Sailing Directions

FOR

THE NORTH SEA.

GENERAL NOTICES.

Throughout the following Work, the Soundings are those taken at low water, spring-tides; the Bearings and Courses are Magnetic, or by Compass; and the Distances are in Nautical Miles, of 60 to a Degree.

The Variation of the Compass off the East Coast of England is about $2\frac{1}{4}$ points west, increasing to the northward to $2\frac{1}{2}$ points off the Coast of Scotland and the Orkney and Shetland Islands. On the opposite shore, between the Coasts of France and Norway, the Variation is nearly 2 points; but in the body of the North Sea, about $2\frac{1}{4}$ points.

By a Regulation of the Trinity House, all Buoys placed over or near the Wrecks of Sunken Vessels are Nun Buoys, painted of a green colour, and marked with the word "Wreck," in order to distinguish them from the regular direction Buoys; but these remain only until the wrecks have been removed or dispersed.

It has also been determined by the same authority, that in future, Gongs are to be used instead of Bells, on board the Light-vessels and at the Lighthouses: and that where Vanes have hitherto been placed upon buoys, Globular Balls will be generally adopted: moreover, that the buoys will not hereafter be numbered, but have each the particular name painted thereon.

A Notice from the Trinity House states, that the red flags formerly exhibited during the day at the mast-heads of the several Light-vessels belonging to that Corporation, will be discontinued; and in lieu thereof, each of the said vessels will be distinguished in the day-time by a red ball or balls at the mast-heads, which, in the event of the vessels driving from their proper stations, will be struck.

An order, recently issued by the Lords Commissioners of the Admiralty, states, that in order to prevent mistakes, which frequently occur from the similarity of the words starboard and larboard, in future, the word PORT is to substituted for larboard, in H. M. ships or vessels.

THE NORTH SEA.

INTRODUCTORY REMARKS.—The navigation of the waters of the North Sea from London, may be said to commence at the Nore; and the greater part of the commerce carried on through its medium, to the various ports on its coasts, and the northern and eastern navigation, being to the northward, through the Swin and King's Channel, we shall commence these Instructions at the Nore, proceeding down the Swin towards Harwich and Orfordness to the northward, respectfully referring the mariner to the Book of Directions for the River Thames and its entrances, which accompanies the large Chart of the River, commencing at London Bridge, and describing the whole navigation to the Downs and Yarmouth Roads.

[NORTH SEA.]

FROM THE NORE, THROUGH THE SWIN AND KING'S CHANNEL, TO HARWICH AND ORFORDNESS.

Description of the Sands, Buoys, and Beacons from the Nore, through the Swin and Sledway, and to Orfordness.

The NORE SAND.—The Nore Sand extends from the shallows of Yantlet Flats and the Blythe Sand, on the southern side of the River Thames, in the direction of S.E. by E. $\frac{1}{4}$ E. From about $\frac{1}{2}$ of a mile to the eastward of the black buoy of the Jenkin,* it commences drying to the extent of 2 miles, and within $1\frac{1}{2}$ mile of the light-vessel. It then runs off to the depths of 10, 15, 18, and 24 feet, to where the vessel is moored.

NORE SAND BUOY.—About $1\frac{1}{2}$ mile from the Jenkin buoy, and N.W. by W. $\frac{1}{4}$ W. from the Nore light-vessel, is a white buoy, on the northern edge of the Nore Sand, in $2\frac{1}{2}$ fathoms water, with Southend terrace bearing N. $\frac{1}{4}$ W.; the Nore light S.E. by E. $\frac{1}{2}$ E., distant nearly 2 miles; and the River Middle east buoy N.N.W. $\frac{3}{4}$ W., westerly. At the distance of $1\frac{1}{2}$ cable north of the buoy, there are $4\frac{1}{2}$ fathoms, thence 5, and $4\frac{1}{2}$ towards the middle of the channel.

The NORE LIGHT-VESSEL is computed to be about 41 nautical, or 47 statute miles distant from London Bridge. The marks for the vessel are, Minster Church on with the easternmost part of a triangular field, called Mizen Hedge, bearing S.S.W. $\frac{1}{4}$ W.; the Garrison Point at Sheerness W.S.W. $\frac{3}{4}$ W., distant $3\frac{1}{2}$ miles; and Great Wakering Church N.N.E. This vessel, which is painted red, with the word "NORE," in white letters, on each side, exhibits one single lantern-light, of considerable brilliancy, elevated 33 feet above the level of the water, and visible in every direction at the distance of 10 miles. In the day-time a red ball is hoisted at the mast-head; and a gong is sounded in foggy or dark weather.

The tides flow at the Nore, on full and change days of the moon, at $\frac{1}{2}$ an hour after 12 o'clock (mean time); and the water rises about 14 feet.

The passage from the Nore and through the Swin and King's Channel, is bounded by the *Foulness*, or *Maplin*, the *Whitaker*, *Buxey*, and *Gunfleet Sands* on the northern side; and the *Mouse*, *Barrows*, *Middle*, *Heaps*, and *Sunk*, on the southern side.

The FOULNESS, or MAPLIN SAND, is an extensive flat, or continuation of sands which run off the northern shore of the Thames, from Leigh and Scuthend, to the eastward, so far as the entrance to the River Crouch. It chiefly dries, and is covered at about $1\frac{1}{2}$ hour flood. Its breadth about Shoebury is a mile from shore. Off Foulness Island it is $3\frac{1}{2}$ miles broad; and off Crouch Point, the entrance of the river, its breadth becomes almost 5 miles. Its eastern edge is steep, and pointed out by buoys, beacons, and a light-house, which will be described hereafter.

The WHITAKER is an extension of the ridge, or north part of the Maplin, from which it runs off in an easterly direction, and has a red buoy lying near its eastern edge. Between this buoy and the Maplin is a swashway, or passage for small vessels into the River Crouch, of 9 and 12 feet.

The BUXEY is a large sand, which is covered at $3\frac{1}{2}$ hours flood; it runs parallel in an east and west direction, to the north part of the Maplin, and is $1\frac{1}{2}$ of a mile wide in its broadest part, forming the northern boundary to the entrance of the River Crouch. Its length is 5 miles. There is a black buoy placed at its western end; and its eastern part forms the Spitway from the Swin to the Wallet, &c., which Spitway is pointed out by two buoys.

The GUNFLEET is an extensive sand, running from the Spitway in an E. $\frac{1}{2}$ N. direction, full 12 miles. Its breadth is from 1 to $1\frac{1}{2}$ mile. Off its western end are the two buoys just mentioned, placed as a guide through the Spitway; at its eastern extremity is a black buoy, with a staff and ball; on its south-eastern edge stands a beacon: and midway between this beacon and the black buoy, is a buoy, coloured black-and-white, in circular bands; and nearly midway between the beacon and the buoy of the

* This buoy is laid down for the purpose of facilitating the navigation of the swashway, called the Jenkin, lying between the Nore Sand and the Isle of Grain.

Spitway, is a buoy, striped red-and-white, and marked "S.W. Gunfleet." Several parts of this sand become dry at low water. At the N.W. part there is a *patch*, called the *West Knock*, of considerable extent, which is covered at 2 hours' flood; and abreast of the beacon is a still larger part, called the *East Knock*, which is covered at 2½ hours' flood. Between these are other places, drying at low springs. The northern edge of this sand forms the southern boundary of the Wallet; and its southern edge is the northern limit of the East Swin, or King's Channel, of which these sands lie all on the north side.

The MOUSE has now become the western extremity of the Barrows, and is distinguished by a black buoy. Near this buoy is a light-vessel, exhibiting one light.

The WEST BARROW is that part of a very extensive *flat*, which forms the southern boundary of the West Swin; it extends from the Mouse buoy full 4 miles, is ½ of a mile wide, and dries, being covered at 2½ hours' flood. On its northern edge is a white buoy, lying E.N.E. ¼ E., 2¼ miles from the Mouse buoy. From the north-eastern part of this shoal, the *Barrow Flats* run north-easterly nearly 10 miles, terminating in two points near the buoy of the Heaps. The Barrow Flats have several parts upon them which dry at low water, and are all over shallow and dangerous; the north-western edge forms the channel between the Flats, and the Heaps and Middle, and has on it a *knoll*, called *East Barrow Head*, nearly a mile in extent, covered at about 1½ hour of the flood. Its south-eastern edge is divided from the Knock John by the Barrow Deeps. These flats are about 3 miles broad.

The SWIN MIDDLE, or HEAPS, form a narrow curved *sand*, 6 miles long, marked out by 2 buoys, and by a light-vessel now stationed at its western end. The channel between it and the Barrow Flats, is called the Middle Deep, and has from 6 to 9 fathoms in it. The passage to the northward is the one commonly used, and called the East Swin, or King's Channel, in which there is a kind of *middle ground*, with from 5 to 6½ fathoms over it; also a *knoll*, called the *Knot*, lying mid-channel between the Middle Ground and Heaps, with 4 and 4½ fathoms on it.

The SUNK is a continuation of the Oaze and Knock John, running in an E.N.E. direction; it is narrow, with numerous dry *patches* upon it, and nearly parallel to the Gunfleet, at 3 or 4 miles distance, with from 8 to 12 fathoms between them. It terminates in a point about S.E. by E. ¼ E., distant 5¼ miles from the Gunfleet beacon. Off its head, distant nearly 1½ mile N.N.E., is a light-vessel; and on the sand head is a chequered red-and-white buoy.

The PASSAGES into HARWICH and toward Orfordness, are formed by the following *shoals*:—the *West Rocks*, *Cork Sand*, *Ledge*, and *Knot*, the *Upper* and *Lower Rough*, the *Shipwash*, the *Baudsey*, the *Kettle Bottom*, the *Whiting*, and the *Culler*, besides several other *shoals* inside of these.

Between the West Rocks shoal and the Gunfleet, is a channel into the Wallet, called Goldmer's Gateway, about 1½ mile wide, and having 5, 6, and 7 fathoms in it. There is also a channel between the West Rocks and the Cork Sand; but it is very narrow, with only 6 feet in it, and too dangerous for a stranger to attempt.

The WEST ROCKS are a dangerous and large cluster, lying directly before the entrance to Harwich, some parts becoming nearly dry at low water. They extend from the Naze Flats to a black-and-white buoy, which is placed on a spit at their eastern end, their breadth being 2 miles. On the buoy, which lies in 3½ fathoms, are painted the words "West Rocks."

CORK SAND.—The east end of the Cork Sand lies N. by W. from the east part of the West Rocks, distant nearly 3½ miles; it thence extends S.W. by W., about 1½ mile, is narrow, and a considerable part dries at low water. One mile N. by W. ¼ W. from the east end of the Cork Sand, lies the south end of the Cork Ledge; it thence extends about a mile, and is nearly ½ of a mile broad. There is 1½ fathom on it. On the north side of the Cork Ledge, a light-vessel is stationed, carrying a bright revolving light.

The CORK KNOT is a *rocky shoal*, lying about 1½ mile from the Cork Ledge, and, apparently, is joined to it. It bears N.E. from the buoy of the West Rocks, distant 4 miles, and has over it 19 and 20 feet.

LOWER ROUGH.—N.E. ¼ E., 2½ miles from the east Spit buoy of the West Rocks, is the east end of the Lower Rough, a *reef*, of 2 to 3 fathoms, running about

SAILING DIRECTIONS FROM

$1\frac{1}{2}$ mile in a N.N.W. direction. Its eastern side has a red buoy upon it, lying in $3\frac{1}{2}$ fathoms water.

UPPER ROUGH.—In nearly the same direction, and nearly midway between the West Rocks and the Lower Rough, lies another *rocky shoal*, called the *Upper*, or *West Rough*, having on its N.W. part only 2 fathoms. The mark for this is, *Arwarton Church* on with the south-western part of Landguard Fort. To the north-eastward of the Upper Rough, lie the Shipwash, Baudsey, and Whiting: the two former of these sands forming the eastern side of the channel, called the SLEDWAY; while the West Rocks, Rough, and Cutler, are its western boundaries.

The **SHIPWASH** is a long and narrow *sand*, having at its S.W. extremity a large buoy, striped horizontally black-and-white, with staff and ball; and near its N.E. end a light-vessel. These lie N.E. $\frac{1}{2}$ N. and S.W. $\frac{1}{2}$ S. from each other, distant 9 miles. Some parts become dry at low ebbs, and both sides are steep. This is a dangerous bank to vessels coming from the offing, as the depth of your soundings give no indication of your approach towards it; and there are 6, 7, and 8 fathoms close to its outer edge. The light-vessel is intended for the use of ships of great draught of water passing through the channel between the Baudsey and Shipwash Sands, called the SHIPWAY, instead of going into Hollesley Bay.

The **BAUDSEY SAND** is almost 4 miles long and $\frac{3}{4}$ broad near its S.W. end; upon it the depths of water are irregular, but nowhere have there been found on it less than 12 feet at low water, although, perhaps, on some of the knolls there may be less. Upon the S.W. part lies a black-and-white chequered buoy, and upon the Bald Head, or N.E. end, lies a black buoy. The extension of this sand to the north-eastward, is now greater than formerly, for with Orford low light and Aldborough mill in one, bearing N.N.E. $\frac{1}{2}$ E., you will pass over it, in $3\frac{1}{2}$ and 4 fathoms. The shoalest water is near its S.W. end, there being only 2 fathoms, commencing near the chequered buoy, and extending thence north and north-easterly nearly a mile. Vessels should, therefore, be cautious of approaching too near this part of the coast. Between the north end of Baudsey Sand and the Shipwash, the channel is about 2 miles wide, in which are 8 or 9 fathoms.

The **WHITING** is a narrow slip of *sand*, lying N.E. by E. $\frac{1}{2}$ E. and S.W. by W. $\frac{1}{2}$ W., $3\frac{1}{4}$ miles in length, and having three white buoys upon it, the northernmost buoy with a staff and ball. The two lights of Orfordness in one, lead just on the inner edge of the sand, and also clears the Cutler; but the low light must be kept to the westward of the high light, in working through Hollesley Bay.

KETTLE BOTTOM.—Between the west end of the Whiting and Baudsey Sand, is a *knoll*, called the *Kettle Bottom*, with only 2 fathoms on it, lying N.N.E. $\frac{1}{2}$ E., distant $1\frac{1}{2}$ mile from the S.W. buoy of the Baudsey. From this knoll a *shoal* projects about $\frac{1}{2}$ a mile to the northward, with $3\frac{1}{2}$ and 4 fathoms on it; and continues to the southward, with the same depths, till it joins the Baudsey Sand, having on each side of it 6 and 7 fathoms water. The channel between them is about $\frac{3}{4}$ of a mile wide. Between the Kettle Bottom and the Whiting, are 6 and 7 fathoms, and a good passage, keeping within $\frac{1}{2}$ a mile from the buoy of the Whiting, or the sea-mark, near the north end of Baudsey cliff, W.N.W. $\frac{3}{4}$ W. The north-east end of Baudsey Sand is opposite to the middle of the Whiting; the channel between them is about 2 miles wide, with 8 and 7 fathoms in it. The mark to carry you through this channel, is Felixstow Church on with the rising part of Felixstow cliff.

The **MIDDLE GROUND** is a *sandy flat*, which extends from the shore at Orford Haven, towards Orfordness, and was formerly distinguished by a buoy at each end.

The **FLAGSTONE** is a *rocky patch*, lying between the S.W. part of the Whiting and Hollesley Middle Ground; it runs in a direction parallel to the Whiting, and has nowhere less than 5 fathoms over it.

The **CUTLER** is a *rocky shoal*, lying about a mile from Baudsey cliff. The lights of Orfordness in one, will lead over its outer edge. A black buoy is now placed near its S.W. end, in $4\frac{1}{2}$ fathoms, with Baudsey Church on with a white house seen above Baudsey cliff, bearing N. $\frac{1}{2}$ E.; and Orfordness low light a little open to the eastward of the high light. It extends S.W. $\frac{3}{4}$ S. and N.E. $\frac{3}{4}$ N., being $1\frac{1}{4}$ mile in length, and about $\frac{1}{2}$ a mile in breadth.

Buoys, Beacons, Light-Vessels, &c.

SHOEBURY NESS, or KNOCK BUOY, (black) lies in 4 fathoms, to be left on the port or larboard side, when outward bound. Its marks are, the ruins of Hadleigh Castle in line with the lighthouse on Southend Jetty, N.W.; the Semaphore on a hill, south of Miletown, in line with Miletown Church, S.S.W. $\frac{1}{4}$ W.; Middle Shoebury buoy S.E. by E. $\frac{1}{4}$ E.; River Middle east buoy W.N.W.; Nore Sand buoy S.W. $\frac{3}{4}$ S.; and Nore light-vessel S.S.E. $\frac{1}{2}$ E.

SHOEBURY MIDDLE BUOY (black) lies in 3 fathoms, with Hamlet windmill in line with the west end of Southend terrace, N.W.; Queenborough windmill in line with the highest windmill at Miletown S.W. $\frac{1}{4}$ W.; and Nore light-vessel S. by W. $\frac{3}{4}$ W.

NORE LIGHT-VESSEL (already described, page 2,) rides in $3\frac{1}{2}$ fathoms, to be left to the starboard.

SHOEBURY EAST BUOY (black) lies in 5 fathoms, to be left on the port or larboard side. Its marks are, a white windmill, inland, in line with the third house eastward of a long barn on Foulness island, N.N.E.; Prittlewell Church on with the third building eastward of Shoebury Preventive Station House, N.W.; and Blacktail beacon E. $\frac{1}{4}$ N.

CANT BUOY is white, and lies upon the edge of the sand, in 4 fathoms, to be left on the starboard side. The marks are, Shottenden mill just open of the high land of Sheppey, bearing S. by W. $\frac{3}{4}$ W.; the Nore light-vessel N.W. by W. $\frac{1}{4}$ W.; and the west buoy of the Oaze E. $\frac{1}{2}$ N., distant $1\frac{1}{2}$ mile.

WEST BUOY of the OAZE is red, and lies in 3 fathoms, on the starboard side. Its marks are, the Nore light-vessel W.N.W. $\frac{1}{4}$ W., distant about $4\frac{1}{2}$ miles; the Blacktail beacon N.N.E. $\frac{1}{4}$ E.; and the buoy of the Spile S.W. by W. $\frac{1}{4}$ W.

BLACKTAIL BEACON is upon the Maplin Sand, and to be left on the port or larboard side. Its marks are, the east side of Canewdon Church tower touching the west end of the buildings at Havengore farm, bearing N.N.W. $\frac{3}{4}$ W.; the Mouse buoy E.S.E. $\frac{1}{4}$ E.; and the Maplin chequered buoy E. $\frac{3}{4}$ N.

MOUSE LIGHT-VESSEL.—This lies in 5 fathoms, with the Blacktail beacon bearing W.N.W.; Canewdon Church tower N.W. $\frac{1}{4}$ N.; the Maplin lighthouse N.E. by E. $\frac{1}{4}$ E.; and the Nore light-vessel, west. This vessel exhibits, from a lantern, a bright light, and is to be left on the starboard hand in going down Swin.

BUOY of the **MOUSE** is black, and lies in 4 fathoms, on the starboard side. Its marks are, the Blacktail beacon W.N.W. $\frac{1}{4}$ W., distant $2\frac{1}{2}$ miles; Canewdon Church on with a small house on Foulness island, N.W. $\frac{1}{4}$ N.; the Nore light-vessel, west, 8 miles; the west buoy of the Oaze W.S.W., distant $3\frac{1}{2}$ miles; the east buoy of the Oaze S.S.E. $\frac{1}{4}$ E., $1\frac{1}{2}$ mile; and the Maplin lighthouse N.E. by E. $\frac{1}{4}$ E. The Mouse separates the West Swin from the Barrow Deep, and hence becomes the eastern boundary of the Swin channel, which here is $1\frac{1}{4}$ mile wide.

WEST BARROW.—A white buoy is moored, in $6\frac{1}{2}$ fathoms, on the starboard side, off the N.W. part, or elbow, of the West Barrow Sand, with the Maplin lighthouse N.E. $\frac{1}{4}$ N.; the buoy of the Mouse W. by S. $\frac{3}{4}$ S., and just clear of the north side of the sand, where it dries at the water's edge; the Blacktail beacon, west, nearly; and the Maplin chequered buoy N.W. by W. $\frac{3}{4}$ W. Three ships' lengths to the northward of the buoy, there are 10 fathoms water.

FOULNESS SPIT, or MAPLIN BUOY, (chequered black-and-white) lies in $2\frac{1}{2}$ fathoms, on the port or larboard side. Its marks are, the Mouse buoy S.S.W. $\frac{1}{4}$ W., distant $1\frac{1}{2}$ mile; the Blacktail beacon W. $\frac{3}{4}$ S., 3 miles; the Maplin lighthouse E. by N., about $2\frac{1}{2}$ miles; the West Barrows buoy S.E. by E. $\frac{3}{4}$ E.; and Minster Church, in the Isle of Sheppey, W.S.W. At the distance of a cable's length to the southward of this buoy, are 10 fathoms at low spring ebbs.

MAPLIN SPIT LIGHTHOUSE.—This lighthouse is erected on screw piles, upon the south-eastern projecting part of the sand, where it becomes dry, or nearly so, at low water, spring-tides. It exhibits a red light, visible in all directions; and mariners are particularly cautioned and enjoined, never, under any circumstances, either by day or by night, to attempt to cross the sand to the northward of the lighthouse.

MAPLIN SPIT BUOY is black, and lies in $2\frac{1}{2}$ fathoms, rather more than a cable's length S.W. from the pile lighthouse. You must not attempt to pass between the buoy and the lighthouse.

SWIN MIDDLE LIGHT-VESSEL.—A light-vessel, showing one revolving light, elevated 36 feet above the sea, has been stationed near the S.W. end of the Swin Middle Sand, in 4 fathoms; the Whitaker beacon N. $\frac{1}{2}$ E.; the Whitaker buoy N.E. $\frac{3}{4}$ N.; and the North Hook Middle (or Elbow) buoy E. by N. This vessel is to be left on the east or starboard side going down.

WHITAKER BEACON.—A standing beacon has been placed upon the Whitaker Sand, with a small white house open to the eastward of Bradwell Chapel, twice the length of the chapel, bearing N.N.W. $\frac{3}{4}$ W.; Brightlingsea Church tower twice its breadth open to the westward of the white mansion, N. $\frac{1}{2}$ E.; Maplin lighthouse S.W.; Ridge buoy W.N.W.; and Canewdon Church W. by N., northerly. This beacon is placed in 4 feet water; and at the distance of 160 fathoms outside of the beacon, there are 3 fathoms. It is to left on the port or larboard side.

WHITAKER SPIT BUOY is red, and lies in 3 fathoms, about a mile E. by N. from the Whitaker beacon, on the port or larboard side. Its marks are, the small building at the entrance of Maldon river, called St. Peter's, or Bradwell Chapel, bearing N.W. $\frac{1}{2}$ N.; and the light-vessel on the west end of the Middle S.W. $\frac{1}{4}$ W., $1\frac{1}{2}$ mile.

SOUTH BUOY of the SWIN SPITWAY is black, and lies in $2\frac{1}{2}$ fathoms; to be left on the port or larboard side. Its marks are, the Cupola on one of the buidings at St. Osyth's, on with the eastern side of a Martello tower, bearing nearly north; and the Whitaker Spit buoy S.W., $1\frac{1}{2}$ mile.

NORTH BUOY of the SPITWAY.—Seven-eighths of a mile N.N.W. $\frac{1}{2}$ W. from the south buoy of the Swin Spitway, lies the red buoy of the Wallet, in 3 fathoms, having a staff and ball. Its marks are, the Naze tower N.E. by E. $\frac{1}{4}$ E., and Brightlingsea Church just open to the right of a three-ridged roofed low building, N. $\frac{3}{4}$ W. These buoys mark the passage into the Wallet, between the sands, and are to be left on the port or larboard side going down the Swin.

S.W. GUNFLEET BUOY.—A buoy, striped red-and-white, and marked "S.W. Gunfleet," to be left on the port or larboard side, is placed in $3\frac{1}{2}$ fathoms water, nearly midway between the Swin Spitway buoy and the Gunfleet beacon, with Great Holland Church N. by E. $\frac{1}{2}$ E.; Naze tower N.E. $\frac{1}{2}$ N.; Gunfleet beacon E. $\frac{3}{4}$ N.; Spitway buoy west; buoy of the Heaps S. $\frac{1}{4}$ E.; and the West Martello tower, on East Ness, N.W. $\frac{1}{2}$ N.

GUNFLEET BEACON stands upon the Gunfleet Sand, and must be left on the port or larboard side. Its marks are, the Naze tower N. $\frac{3}{4}$ E., distant $6\frac{1}{2}$ miles; the buoy of the Heaps S.W. by W., 5 miles; the S.W. Gunfleet buoy W. $\frac{3}{4}$ S., 4 miles; and the south buoy of the Spitway W. $\frac{1}{4}$ S., distant 8 miles.

A BUOY, painted black-and-white, with circular bands, is laid down about midway between the N.E. Gunfleet buoy and the Gunfleet beacon, in 5 fathoms, at low water, spring-tides. Its marks are, the second house westward of Walton terrace, apparently midway between two clumps of trees on the back land, bearing N.N.W.; Great Clacton windmill its apparent width open westward of a small white house on the cliff, N.W. by W. $\frac{1}{2}$ W.; Naze tower N. by W. $\frac{1}{2}$ W.; N.E. Gunfleet buoy N.E. by E. $\frac{1}{2}$ E.; Gunfleet beacon W. by S. $\frac{1}{2}$ S.; and the Sunk light-vessel S.E. $\frac{3}{4}$ E.

GUNFLEET EAST BUOY is black, with a staff and ball upon it, and lies in 4 fathoms; to be left on the port or larboard side. The marks are, the Naze tower and Walton hall in one, bearing N.W. $\frac{1}{2}$ N.; the Gunfleet beacon W.S.W., distant 5 miles; the lights at Harwich N. by W., nearly; and the Sunk light S. by E., distant $3\frac{1}{2}$ miles.

MIDDLE HOOK, or ELBOW BUOY, is chequered black-and-white, and lies in 3 fathoms; to be left on the starboard. Its marks are, the Whitaker beacon W. $\frac{3}{4}$ N., 3 miles; the Whitaker Spit buoy W.N.W. $\frac{1}{2}$ W., $2\frac{1}{2}$ miles; Swin Middle light-vessel W. by S., 3 miles; and the white beacon-buoy of the Heaps E. by S. $\frac{1}{4}$ S., distant $3\frac{1}{2}$ miles.

BUOY of the HEAPS is white, with a staff and ball, and lies in 3 fathoms; to be left on the starboard. The marks are, the Naze tower N.N.E. $\frac{1}{4}$ E.; Great Holland Church N. by E.; the Gunfleet beacon N.E. by E.; and the Sunk light-vessel E. by N., distant nearly 9 miles.

SUNK LIGHT-VESSEL is sloop-rigged, similar to that at the Nore, and shows one bright light, 30 feet above the sea, visible at all points 3 leagues off. It lies nearly $1\frac{1}{2}$ mile N.N.E. from the eastern end of the Sunk, in 10 fathoms, and is to be left on

the starboard. Its marks are, the Gunfleet beacon bearing W. by N. $\frac{1}{4}$ N., distant nearly 5 miles; the Naze tower N.N.W. $\frac{1}{4}$ W., $8\frac{1}{2}$ miles; the Gunfleet beacon-buoy N. by W., 3 miles; the black-and-white buoy on the West Rocks N.N.E., 5 miles; the red buoy of the Rough N.N.E. $\frac{3}{4}$ E., $7\frac{1}{4}$ miles; the S.W. beacon-buoy on the Shipwash N.E. by E., distant $7\frac{1}{2}$ miles; and the Long Sand Head buoy S.E. $\frac{1}{4}$ E., easterly, $5\frac{1}{2}$ miles.

SUNK SAND HEAD BUOY is chequered red-and-white, and lies in 4 fathoms, with the Gunfleet beacon bearing W.N.W.; and the Naze tower N.N.W.

LONG SAND HEAD BUOY is black, and lies in 6 fathoms; to be left on the starboard. Its marks are, the Naze tower just touching the S.W. side of Walton hall N.W. $\frac{1}{4}$ N.; the Sunk light-vessel N.W. $\frac{3}{4}$ W., $5\frac{1}{2}$ miles; and the Kentish Knock light-vessel S. by W.

BUOY of the S.E. SPIT of WEST ROCKS is chequered black-and-white, marked with the words "West Rocks," lying in $3\frac{1}{2}$ fathoms; to be left on the port or larboard. The marks are, the Gunfleet beacon-buoy S.W. $\frac{1}{4}$ W., distant 2 miles 7-10ths; the Sunk light-vessel S.S.W., 5 miles; the buoy of the Rough N.E. $\frac{1}{4}$ N., 2 miles 3-10ths; the S.W. buoy of the Shipwash E. $\frac{1}{4}$ S., $4\frac{1}{2}$ miles; the sea-mark on Baudsey cliff N. by E. $\frac{3}{4}$ E., 8 miles 1-5th; and the Naze tower W.N.W. $\frac{1}{4}$ N., distant $6\frac{1}{2}$ miles.

STONE BANK BUOY is black, with a white cross on its top, and a white-painted band round its top and middle. It lies on the upper part of the Stone Bank, between the West Rocks and the Harwich Naze, in $2\frac{1}{2}$ fathoms. Its marks are, the Naze tower W. by S.; Harwich high light N. $\frac{1}{4}$ W.; and Dover Court Church N.N.W.

CORK LEDGE LIGHT-VESSEL.—This vessel shows a bright revolving light, and lies in $4\frac{1}{2}$ fathoms at low water, spring-tides; to be left on the port or larboard. The marks are, the S.W. land well open of Harwich Naze S.W. by W. $\frac{1}{4}$ W.; Walton Martello tower, just open north of the East Martello tower, N.W. $\frac{3}{4}$ N.; Harwich high lighthouse N.W. $\frac{3}{4}$ W.; Platters buoy N.W. by W. $\frac{1}{4}$ W.; Andrews buoy W. by N. $\frac{1}{4}$ N.; Inner Ridge buoy W. $\frac{3}{4}$ N.; Rough buoy S.E. $\frac{1}{4}$ E.; and Cutler buoy E.N.E.

BUOY of the LOWER ROUGH is red, and lies on the eastern side of the Rough, in $3\frac{1}{2}$ fathoms; to be left on the port or larboard side. Its marks are, the buoy on the east spit of the West Rocks S.W. $\frac{1}{4}$ S., distant 2 miles 3-10ths; the Sunk light S.S.W. $\frac{3}{4}$ W., $7\frac{1}{2}$ miles; buoy on the S.W. end of the Shipwash S.E. by E., 3 miles 2-10ths; buoy on the south part of the Baudsey N.E. $\frac{1}{4}$ N., 4 miles; and Baudsey Church open to the left or westward of Baudsey sea-mark, N. $\frac{1}{4}$ E., $6\frac{1}{2}$ miles from the latter.

BUOY on the south end of the SHIPWASH SAND is large, and striped horizontally black-and-white, surmounted by a black ball, and lies in 4 fathoms; to be left on the starboard. The marks are, the Sunk light S.W. by W., distant $7\frac{1}{2}$ miles; the Gunfleet beacon-buoy W. by S., 7 miles; the Rough buoy N.W. by W., 3 miles; and the Baudsey S.W. buoy north, $4\frac{1}{2}$ miles.

LIGHT-VESSEL at the N.E. end of the SHIPWASH, is moored in 9 fathoms at low water, spring-tides, and lies with Aldborough Church N. by E.; Orford high light N. by W.; Baudsey Church, half the apparent length of its tower to the east of the second Martello tower on the cliff, W. by N., northerly; and Baudsey N.E. buoy W. $\frac{1}{4}$ N. The appearance of this vessel during the day-time, will be that of a vessel having one mast only, surmounted by a red ball, instead of three masts as heretofore.—*Trinity House, London, 6th July, 1843.*

Mariners are to observe, that a S.W. course from the light-vessel, (having due regard to the tides,) will carry a vessel clear of the sand.

BUOY on the S.W. end of BAUDSEY SAND is chequered black-and-white, and lies in 4 fathoms; to be left on the port or larboard in proceeding through the Shipway towards Orfordness. The marks are, the high light of Orfordness N.E. $\frac{1}{4}$ N., distant $7\frac{1}{2}$ miles; Hollesley Church N. by W.; Baudsey beacon N.W. by N., $3\frac{1}{2}$ miles; the N.E. buoy N.E. by E. $\frac{3}{4}$ E.; the Rough buoy S.W. $\frac{1}{4}$ S., 4 miles; and the Sunk light S.S.W. $\frac{3}{4}$ W., 11 miles.

BUOY on the N.E. end of BAUDSEY SAND.—This buoy (black) has been lately removed about $\frac{3}{4}$ of a mile, in a N.E. direction from its former situation, and now lies in 5 fathoms, with Aldborough Church well open to the eastward of Orfordness beach

bearing N.N.E. $\frac{1}{2}$ E.; Baudsey Church open twice its width to the westward of the second tower below Baudsey cliff, W.N.W.; the N.E. Whiting buoy N. by E.; Baudsey beacon W. by N. $\frac{1}{2}$ N.; and Orfordness high light N.N.E. This end of the Baudsey Sand is called the Bald Head.

BUOY of the CUTLER is black, and lies in $4\frac{1}{2}$ fathoms; to be left on the port or larboard side. The marks are, Baudsey Church on with a white house seen over Baudsey cliff, bearing N. $\frac{1}{2}$ E.; and the low lighthouse at Orfordness a little open to the southward of the high one.

BUOY of the S.W. end of the WHITING is white, and lies in $3\frac{3}{4}$ fathoms water, with a white mill up the country, a little open to the westward of a white house, and entering on a grove of trees, bearing N. $\frac{1}{4}$ W.; and the lower lighthouse a little open to the southward of the high lighthouse at Orfordness.

BUOY on the ELBOW of the WHITING is white, and lies in 3 fathoms water, on the inner edge of the sand, $2\frac{1}{4}$ miles from the S.W. buoy. Its marks are, Orfordness lighthouses in one, bearing N.E. by E.; and Orford Castle N. by E., with a white mill a little open to the westward of it.

BUOY on the N.E. end of the WHITING is white, with a staff and ball, and lies in $3\frac{3}{4}$ fathoms water, within $\frac{3}{4}$ of a mile of the opposite beach. Its marks are, Orford Church bearing N. by W.; and the high lighthouse N.E. $\frac{1}{4}$ N.

BUOY of ALDBOROUGH KNAPES is chequered black-and-white, and lies in 5 fathoms, on the eastern edge of the shoal. Its marks are, Aldborough Church N.W.; Orford high light W. $\frac{3}{4}$ S.; Orford Church and Castle in one, W. $\frac{1}{4}$ N.; and Iken Church, which has a steeple tower, nearly N.W. by W., $\frac{1}{3}$ the apparent distance between Aldborough town to Slaughden houses.

DIRECTIONS FOR SAILING FROM THE NORE, THROUGH THE SWIN, &c.

SAILING from about $\frac{1}{2}$ a mile to the northward of the Nore light-vessel to a fair berth between the Mouse light-vessel and the Blacktail beacon, the course and distance are E. $\frac{1}{2}$ S., $6\frac{1}{2}$ miles, and from thence to abreast of the Maplin lighthouse, E.N.E. $\frac{3}{4}$ E., $5\frac{1}{2}$ miles, allowance being made for the tides, observing, that the ebb sets to the S.E. and east. Or, being at the same distance from the Nore light, you may steer E.S.E. $\frac{3}{4}$ E., $4\frac{1}{2}$ miles, or until the Blacktail beacon bears N.E. $\frac{1}{4}$ N., and then proceed E.N.E. $\frac{1}{2}$ E., $7\frac{1}{2}$ miles, to the Maplin lighthouse. There is a *long narrow flat* between the Nore light and the Oaze, lying nearly mid-channel, called the *Warp*, with $4\frac{1}{2}$, 5, and 6 fathoms upon it, having deeper water on each side of it. Keep to the northward of the Warp until you get nearly abreast of the Blacktail beacon, athwart of which are 7, 8, and 9 fathoms. When thus far, if the wind and tide do not allow you to proceed through the Swin, you should anchor, with the Nore light bearing W. $\frac{1}{4}$ S., distant $5\frac{1}{2}$ miles. In turning, take care not to go too far to the northward of the Warp, as the Maplin Sand is steep-to.

There is a channel between the EAST and WEST BARROWS, with from 6 to 20 feet in it; but it is very narrow, being only 2 cables' length in width. It lies N.W. and S.E., and is $1\frac{1}{4}$ mile in length. Its N.W. entrance lies east, $1\frac{3}{4}$ mile from the Maplin lighthouse. The passage, therefore, for ships is between the Barrows and Maplin Sands, this part being called the West Swin.

IN WORKING DOWN FROM THE NORE, when opposite the Blacktail beacon, you may stand to the northward into 6 or 8 fathoms, and towards the OAZE into 7 or 6 fathoms. But when you get down so low as the Mouse light-vessel, you must not stand into less than 7 fathoms on either side. In the middle channel are 11, 10, and 9 fathoms. From abreast of the Blacktail to the Maplin lighthouse, the course is from E. $\frac{1}{2}$ N. to E. by N., and the navigation somewhat difficult. Be careful, in running from the Warp, not to go too far to the southward, lest the tide should set you to the southward of the Mouse. The course from abreast of the Maplin lighthouse to the Middle light-vessel, which must be passed to the westward, is N.E., and the distance 4 miles. In turning from the

Maplin lighthouse to the Middle light-vessel, you may stand to the Barrows into 6 fathoms, and towards the Maplin Sand into 6 fathoms. Between the Maplin light-house and the Middle light-vessel, there is good anchorage any where, from a mile below the former, to within a mile above the latter, in 8, 7, and 6 fathoms. This is an excellent roadstead; but care should be taken, lest you get into the Middle Deep, which now forms a channel 6 miles long, with from 5 to 8 fathoms in it. The tide here sets with great strength; and you will be endangered by running on the Barrow Sands.

The channel between the Swin Middle light-vessel and the Whitaker Spit is very narrow, being not much more than $\frac{1}{2}$ a mile wide, with 5 and 6 fathoms water in it, between the Heaps and Gunfleet. From abreast of the light-vessel to the chequered buoy of the Hook, the course is about E. $\frac{3}{4}$ N., and the distance 3 miles; this direction will carry you right through the East Swin, or King's Channel, clear of every danger, to abreast of the Sunk light; and when the Sunk light bears S.S.E., distant $1\frac{1}{2}$ mile, steer N.E., a little easterly, and it will lead you between the Baudsey and Shipwash, and to the northward of the Aldborough Knaps. From the buoy of the Hook to the eastern white buoy of the Heaps, the course is E. by S. $\frac{1}{4}$ S., distant $3\frac{1}{2}$ miles.

MALDON, or BLACKWATER RIVER.—The Spitway is a passage out of the Swin into the WALLET, or the MALDON RIVER, between the east end of the Buxey and the west end of the Gunfleet, and has from about 8 to 9 feet in it at low water. The entrance to Maldon is obstructed by several shoals, some of which dry, and others have very little water over them. Your course through the Spitway is N.N.W. $\frac{1}{2}$ W., $2\frac{1}{2}$ miles, leaving the 2 buoys on the western, or port or larboard side; and from the Spitway to the entrance of Maldon River, steer N.W. Here are 2 buoys: the southern, or white one, lies on the east end of the *knoll*, in 2 fathoms water; its marks are, Barn Hall, 2 ships' length open of the west end of Mersey Island, bearing N.W. $\frac{1}{2}$ N.; Brightlingsea Church, on with My Lady's White House, N. $\frac{1}{4}$ E.; St. Osyth's Church, on with the middle of Eagle Hedge, N.E. by N.; and the North Spitway buoy S.E.

The black buoy lies on the S.E. end of the Eagle, in 2 fathoms also; its marks are Barn Hall, a ship's length open of the west end of Mersey Island, bearing N.W. $\frac{1}{4}$ N.; Brightlingsea Church and My Lady's House in one; the white buoy of the knoll S. $\frac{1}{4}$ W.; St. Osyth's Church on the middle of Eagle Hedge, and the S.W. land E. by N. Steer between these 2 buoys, and you will get over the bar, into 7 and 8 fathoms water, off the red buoy, or Colne Bar Head, and may proceed up the River Mersey, keeping mid-channel until you have passed the western end of Mersey Island, when you find the water increase in depth.

The above-mentioned red buoy is placed at the entrance to the River Colne, at the Bar Head, in 3 fathoms, bearing from the Eagle buoy N.W. by N., and from the knoll buoy N. by W. $\frac{1}{4}$ W. It lies with little Holland cliff just open of Eastness Point E. $\frac{1}{4}$ N.; and Brightlingsea Church on with the west and highest part of Brightlingsea Wood, N. $\frac{3}{4}$ E. The course from the Bar Head up the River Colne is about north, leaving the red buoy on the east or starboard side.

There is good anchorage and deep water behind the BUXEY, in a place called Swire Hole, in from 5 to 8 fathoms; there is also a passage for small vessels to the westward of the Buxey, leading to the River Crouch; but the best channel to this river is to the southward of the Buxey. On the north end of the Maplin Sand is a red buoy, which you must leave to the port or larboard; and at the western end of the Buxey, on the starboard side, is a black buoy; this passage is about $\frac{3}{4}$ of a mile wide; but within it lies the *Sunken Buxey*, part of which dries at low water, dividing and narrowing that part of the channel, in which are 2 fathoms water.

The channel between the Swin Middle and Heaps on one side, and the Gunfleet on the other, is 2 to $2\frac{1}{2}$ miles wide: but when you have passed the buoy of the Heaps, the passage is $4\frac{1}{2}$ miles broad; this is called the East Swin, or King's Channel. As there are 5 fathoms close to the Middle and Heaps, you should not come nearer to any part of them than into 7 fathoms. Between the Middle Ground and Whitaker Flats are $5\frac{1}{2}$ to 6 fathoms; and between the former and the Gunfleet are 6 and 8 fathoms.

The Sunk Sand is steep-to on both sides. In working down between the Sunk and Gunfleet, stand no nearer to the Sunk than to bring the light-vessel about E. by N., but not more to the northward; you will then have 10, 11, and 12 fathoms water.

[NORTH SEA.]

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Come not nearer the Gunfleet than 6 or 7 fathoms. When the Sunk light-vessel bears E. by N., you are then in the line between it and the buoy of the Heaps.

TIDES.—It is high water in the King's Channel, on full and change days, at 12 o'clock; spring-tides rise about 16 feet, and neaps 10 feet; but allowance must be made for the wind, remembering that the tide flows sooner with an easterly wind, and later with an opposite one. In the West Swin, from the West Spitway to the west end of the Oaze, the stream changes its direction at 20 minutes after 12; in the middle, between the east end of the Gunfleet Sand and Harwich Naze, at 10 minutes past 12; and at about 2 miles S.S.W. from the same end of the Gunfleet, at 12 o'clock.

At the entrances of Burnham, Maldon, and Colne Rivers, it is high water at 12, and the rise is about 14 feet; but at Maldon Quay, at 1 o'clock, the rise being there only 6½ feet.

Through the King's Channel and West Swin, the flood-tide sets into the river nearly in the direction of the several shoals. The flood sets, during the first 2 hours, with great velocity between the Sunk and the Long Sand, and the ebb in a contrary direction. Through the Swin the tide sets with considerable strength, especially in the West Swin, between the Mouse and Maplin, as also through the Middle Deepes. The ebb-tide sets obliquely, with much strength, over the Mouse and West Barrows; you must, therefore, be careful in going down, that it does not set you aground between them: indeed, it is necessary to use the same caution in passing through any of the channels, as the tides, setting W.S.W. and E.N.E., take an oblique direction over many of the sands and shoals, particularly those between the north end of the Shipway and Gunfleet.

DIRECTIONS FOR SAILING FROM THE KING'S CHANNEL TOWARDS ORFORDNESS.

SHIPS bound outward from the Swin, or King's Channel, to the north-eastward, by Orfordness, may sail through between the Baudsey and Shipwash Sands, in what is called the Shipway; or, hauling up through the Sledway, between the Rough and Baudsey, pass through Hollesley Bay, to the westward of the Whiting, towards Orfordness.

In proceeding through the Shipway, when you arrive about midway between the east buoy of the Gunfleet and the Sunk light-vessel, having the former bearing N.N.W. or N. by W. from you, distant 2 miles, you should steer N.E., which course kept on for 16 miles, will bring you to a berth 2 miles S.E. by S. of Orfordness low light. When you have sailed on this course nearly 4 miles, you will be abreast of the chequered black-and-white buoy of the West Rocks; leaving that on your port or larboard hand, distant a mile, and sailing 3 miles farther on, you will find yourself directly between the red buoy of the Rough and the large black-and-white striped beacon-buoy on the S.W. end of the Shipwash, with the Rough on your port or larboard side, and the Shipwash on the starboard; 4 miles farther you will reach the S.W. buoy of the Baudsey, which is chequered; this you will leave on your port or larboard side, at the distance of 1½ mile; the black buoy on its N.E. end, is also to be left on the port or larboard side. Five and a-half miles beyond the Baudsey S.W. buoy, you will reach the light-vessel at the N.E. end of the Shipwash; you may then shape your course towards Orfordness in the same direction, until you come within 2 miles of the Ness, when, by steering N.E. ½ N., you will go to the westward of the Knapes or Napes; or, altering the direction to N.E. by E., pass to the south-eastward of that shoal.

Throughout the whole of the preceding navigation, your depths of water will vary from 11 to 5, and from 6 to 13 fathoms; but great care must always be taken to keep off the shoals, for their edges are steep, and proper allowance must be made for the setting of the tides: the flood setting about W.S.W., and the ebb E.N.E., over the Shipwash, which renders this sand very dangerous.

In proceeding through the Sledway towards Hollesley Bay, when midway between the Gunfleet east buoy and the Sunk light-vessel, steer N.E., until you have passed the

buoy of the West Rocks nearly 2 miles, or until you get Butley Church just open to the eastward of Boyton Mill, and to the westward of Boyton Wood, bearing N. by E. $\frac{1}{2}$ E., a little easterly, which mark will carry you directly through the Sledway to the eastward of the Rough, in from $4\frac{1}{2}$ to 7 or 8 fathoms water, at the distance of 2 cables' length to the eastward of the red buoy of the lower Rough. Proceed with this mark on, in 6, 8, and 7 fathoms, until Orford N.W., or White Mill, comes a little open of Haver-gate Island. House, bearing N.E. $\frac{1}{4}$ N.: keep this mark on until you get between the S.W. end of the Whiting and the Middle Ground, or until Orford high lighthouse appears about twice its height to the southward of the low lighthouse, when you will be on the shoalest part of the Flagstone, in $5\frac{1}{2}$ fathoms; this is the leading mark through Hollesley Bay; proceed with it until you come to the north-eastward of the hook or elbow of the Whiting, when you should steer E. $\frac{1}{2}$ N.; this will carry you to the southward of the Knapes. The mark to clear its S.W. end, is Orford Castle a sail's breadth open to the southward of the Church, bearing W. by N. Take care not to bring Orford high light to the southward of west, until Iken Church opens to the northward of the Limekiln. But if desirous of going between Aldborough Knapes and the main, then give Orfordness a good berth, and keep Baudsey Church well open to the southward of the Ness, bearing W.S.W. $\frac{3}{4}$ W., in order to avoid the Onion, or Nathaniel's Knoll, and the Ridge, until Aldborough Church bears N.N.W.; then haul up N.E. $\frac{1}{4}$ N. which will lead to the northward of the Knapes.

In turning to windward, stand no nearer to the west end of the Shipwash than till Baudsey Church comes on with the north-east end of the long wood which stands to the eastward of Baudsey cliff; nor to the West Rocks, than till Alderton Church comes on with Baudsey Church. Stand no nearer to the West Rocks than 5 fathoms, nor to the Shipwash than 8 fathoms. After you have passed the Rough, stand no nearer to Baudsey Sand than till the tree, which stands to the northward of Orford Church, comes near to the west side of that Church; nor the Cork Sand, or Cork Ledge, than till Harwich Church steeple comes on with the Martello tower, which stands a little to the northward of Landguard Fort. In the night, stand no nearer to the ledge than 5 fathoms, nor nearer the Cutler than $5\frac{1}{2}$.

Sailing from the Gunfleet beacon buoy to the upper anchorage in Hollesley Bay, steer N.E. by E. $\frac{1}{2}$ E., 3 miles; and then from off the chequered buoy of the West Rocks, a N.E. course for 3 miles will lead clear to the eastward of the lower Rough buoy; when you may bring Baudsey Church open to the eastward of the new beacon, bearing N. $\frac{1}{4}$ W., and run in for the black buoy of the Cutler, from off which, the course to the anchorage in Hollesley Bay, is N.E. $\frac{1}{4}$ N., distant about 3 miles.

The best anchorage in HOLLESLEY BAY, is with Hollesley Church bearing N. by W. $\frac{1}{4}$ W., or with the Parsonage House in one with the Red Barn, in 5 or $4\frac{1}{2}$ fathoms. There is good anchorage in the north-eastern part of the bay, between the Middle or Hook buoy of the Whiting and the N.E. end of the Middle Ground, in a depth of 6 or 7 fathoms. In Hollesley Bay the tide flows, on the change and full days of the moon, at 11 o'clock.

In turning through Hollesley Bay, stand no nearer on either side than 6 fathoms, nor to the beach than 7 or 8 fathoms.

Close to Orfordness the depth is 10 fathoms, with a hard bottom, and so steep that you should not approach it with less than 12 fathoms. To the westward of the Onion there is a counter-tide, which runs down with as much velocity as the tide in the channel runs up; therefore, be careful not to get into this eddy, as some ships, in turning, have missed stays, and run on shore.

HOLLESLEY, OR HOSLEY, BAY TO HARWICH.

Description of the Shoals, Buoys, &c.

THE entrance to Harwich is encumbered with numerous *shoals*, which lie within those already described; and the passage from Hollesley Bay to Harwich Harbour, is bounded by the following:—the *Cutler*, the *Platters*, the *Andrews*, and the *Felixstow* and *Wadgate Ledges*, all of which lie on the starboard side; also the *Cork Knot*, *Cork*

Ledge, Cork Spit, the Ridge, Halliday Flats, the Altar, Cliff Foot, Cod, Glutton, Guard Bone, and Gristle; most of which are to be left on the port or larboard side.

The CUTLER is a *rocky shoal*, of irregular depth, lying directly off Baudsey cliff, and distinguished by a black buoy, placed at its southern point, in $4\frac{1}{2}$ fathoms; its marks being, Baudsey Church open to the left of Baudsey sea-mark, bearing N. $\frac{1}{2}$ E.; and Orford low light a little open to the southward of the high light.

FELIXSTOW and WADGATE LEDGES lie on the northern side of the channel, the former stretching a full mile off Felixstow cliff, and having 3 and 2 fathoms on its outer parts. The Wadgate is a small *rocky patch*, of 3 fathoms, a little to the south-westward of the former ledge. Burnthouse cliff just open of the Naze cliff, bearing S.W. by W. $\frac{1}{2}$ W., will lead to the southward of both these ledges; which ought not to be approached nearer than 4 fathoms water.

The PLATTERS extend almost a mile from the shore, the outer part lying S.E. by E. from Landguard Fort, and nearly dry at low water. Come no nearer to them than 5 fathoms. The mark to carry you clear of them is, Orford Church and Castle open of Baudsey cliff. Off the east spit of the Platters is a black buoy, in $4\frac{1}{2}$ fathoms, with Harwich Church on with the cupola of the Chapel of Landguard Fort, bearing N.W.; and the white house at Baudsey ferry on with the N.E. end of Felixstow cliff, N.E.

The ANDREWS.—To the westward of the Platters is the Andrews, another dangerous *shoal*, almost dry, and, on its western side, steep-to. It lies within the Platters, and extends nearly $\frac{1}{2}$ a mile S.S.E. from the Stony Beach; the first half-ebb sets over it very strong. This forms the starboard boundary of the entrance to Harwich harbour. On the edge of the Andrews, or West Spit, a black buoy is laid, in 4 fathoms, with Arwarton Church on with Harwich high lighthouse N.W. by N.; Baudsey Church on with the N.E. end of Felixstow cliff N.E. $\frac{1}{2}$ E.; and the buoy of the Platters E. $\frac{1}{2}$ S.

CORK KNOT, LEDGE, and SPIT.—The two former have already been described in page 3. The Cork Spit N.W. end lies $\frac{1}{2}$ mile S.E. $\frac{1}{2}$ E. from Landguard Fort; the least water over it is $2\frac{1}{2}$ fathoms. Burnthouse cliff just open to the left of Naze cliff, leads over its S.E. end. These shoals are all to be left on the port or larboard side; and the space between them and Felixstow and Wadgate Ledges, is commonly called Felixstow Road.

The RIDGE is a *rocky ledge*, lying also on the south side of the channel, extending N.W. and S.E., $\frac{1}{2}$ of a mile, and is above $\frac{1}{2}$ of a mile broad; the least water over it is 6 feet. On its S.E. end is placed a buoy, chequered red-and-white, in $2\frac{1}{2}$ fathoms, with the chimney of the white house at Shotley on the middle of the red-tiled Queen's storehouse, in the dock-yard at Harwich, bearing N. by W. $\frac{1}{2}$ W.; the westernmost Martello tower at Woodbridge Haven just open with the N.E. end of Felixstow cliff, bearing N.E. $\frac{1}{2}$ E.; buoy on the Stone Banks S.S.W. $\frac{1}{2}$ W.; buoy on the Platters N.E.; and the buoy on the Andrews, north.

There is also a white buoy on the inner part of the ridge, laid in $2\frac{1}{2}$ fathoms, with Arwarton Church touching the west part of the Martello tower immediately to the south-westward of Harwich, bearing N.W. by N.; a large tree inland, its width on the low part of Felixstow cliff N.E. $\frac{1}{2}$ E.; buoy on the Andrews N.N.E.; and the S.E. buoy of the Ridge S. $\frac{1}{2}$ E. Between this buoy and that of the Andrews, which are only $\frac{1}{2}$ of a mile asunder, is the usual channel into the harbour, in 4 fathoms, over the bar which separates the Pitching from the Rolling Ground.

The HALLIDAY FLATS extend in a N.W. by W. $\frac{1}{2}$ W. direction from the inner buoy of the Ridge, having on the edge 13, 11, 12, and 13 feet water. These flats form the southern boundary of the Rolling Grounds; while the Andrews Spit and Beach End form the northern boundary. To mark the shoal ground off Landguard point, a black buoy has been placed, marked "Beach End," off the South Spit thereof, in $2\frac{1}{2}$ fathoms, with the Martello tower on the mound of Felixstow, in line with the S.E. angle of Landguard Fort, N.E. by E.; Harwich high light tower its apparent width open west of the low lighthouse, N.N.W. $\frac{1}{2}$ W.; and Andrews buoy S.E.

The ALTAR is a *rocky shoal*, of only 7 feet water, and is situated north, nearly $\frac{1}{2}$ of a mile from the black buoy on the Beach End, and W. by S., nearly $\frac{1}{2}$ a mile from the cupola of Landguard Fort.

The ALTAR FLAT lies to the northward of the Altar, and extends, in an angle, from the shoal part, N.W. by N. to N.N.E., having from 10 to 12 feet on it; the northern edge being $\frac{1}{2}$ of a mile from the Altar. On this is a buoy, painted black, and marked

on the head, "West Altar," placed on the western elbow of the shoal. It lies in 3 fathoms, with the Martello tower on the mound of Felixstow, in line with the northernmost boat-house next north of Landguard Fort, N.E. by E. $\frac{3}{4}$ E.; Harwich high light tower just open north of the low lighthouse, N.W. by N.; Beach End buoy S. by E. $\frac{1}{4}$ E.; Cliff Foot Rock buoy S.W. by W. $\frac{1}{4}$ W.; and Glutton buoy N.E. $\frac{1}{4}$ N.

The CLIFF FOOT ROCKS lie to the westward of the Altar; and between them is the entrance into the channels of Harwich harbour. The eastern edge of the rocks is marked with a chequered black-and-white buoy, bearing from the Beach End buoy N.W. by W. $\frac{1}{4}$ W., and from the buoy of the Altar S.W. by W. $\frac{1}{4}$ W. This shoal extends more than $\frac{1}{2}$ of a mile in a N.N.W. direction, to within 2 cables' length of Blackman's Head, off the Beacon cliff, and has not more than 2 feet on its shoalest part. Off Blackman's Head is a black buoy, and to the southward, on the edge of the bank which surrounds the Beacon cliff, are two others, while to the northward are also two; these five black buoys mark the Ordnance boundary.

The COD BANK lies a full $\frac{1}{4}$ of a mile N.N.E. from the buoy of the West Altar, and $\frac{1}{2}$ a mile from Landguard Fort, having 9 to 12 feet over it at low water.

The GLUTTON lies to the northward of the Cod, and has from 7 to 12 feet over it; the western edge bears N. by E. $\frac{1}{4}$ E. from the buoy of the Altar; the eastern edge is marked with a red buoy, which lies in 9 feet, with Harwich Church spire N.W. by W. $\frac{3}{4}$ W.; Harwich cliff end W. $\frac{3}{4}$ S.; and Felixstow Martello tower E. by N.

The GUARD, or HARWICH SHELF, extends round the point of Harwich, to the distance of 3 cables' length, and has from 2 feet to 1 fathom upon it; from thence it stretches another 3 cables, deepening to 2 fathoms, and forms the western side of the western channel. Part of this shelf dries from the point of Harwich, to 2 cables' length.

The BONE and GRISTLE are both within the bar, and lie in the middle of the channel. The Bone is the larger and most easterly of the two, having 5, 6, and 12 feet over it, and lying $\frac{1}{2}$ a mile from the opposite shore, between which is 6 fathoms, and the common passage for ships. The Gristle is a round shoal, of 6 and 3 feet, and lies just within the Bone, and about $\frac{1}{2}$ of a mile from the Guard, between which is 4 fathoms. The red buoy placed upon the north end of this shoal, lies in 2 fathoms, with Landguard Fort cupola its width open east of the flagstaff on the fort, S. by E.; Harwich low lighthouse its apparent width on with the north angle of Harwich citadel, W. by S. $\frac{3}{4}$ S.; and Glutton buoy S. $\frac{3}{4}$ E.

WALTON FLAT is the shoal water that stretches off the dry beach, at low water, opposite to Walton Martello tower and ferry, a full cable's length, and towards the River Orwell, having from 1 to 4 feet on it.

The HORSE BANK is a shoal, of 3 to 7 feet, lying a cable's length off Bloody Point of the Shotley Flats, between the Rivers Stour and Orwell.

DIRECTIONS FOR SAILING FROM HOLLESLEY BAY TO HARWICH.

IN running from Hollesley Bay for Harwich, bring Orfordness low lighthouse a little open to the N.W. of the high lighthouse; and when Baudsey Church bears N.N.W. $\frac{1}{4}$ W., being in one with the east part of Baudsey Wood, you will find yourself near the north-east end of the Cutler: then open the low light to the eastward, or right hand of the high lighthouse, keeping it in that direction till Ramsholt Church appears to the westward of Baudsey cliff, you will then have passed to the westward of the Cutler buoy, and be at the entrance to Felixstow Road, with Baudsey Church bearing N.N.E., Landguard Fort W.N.W. $\frac{3}{4}$ W., and the buoy of the Cutler E.N.E. $\frac{3}{4}$ E., distant $1\frac{1}{4}$ mile. From thence a west course will take you through Felixstow Road to the Pitching Ground, past the Cork Ledge light-vessel, giving it a good berth on the port or larboard side in passing, to avoid the Cork Spit; pay proper attention to the tide, and come no nearer to the Cutler than 5 fathoms water. When Dover Court Church bears N.W. by W., westerly, steer right towards it between the buoys of the Ridge and

Andrews, until Harwich high lighthouse comes its own breadth open west of the low lighthouse, bearing N.N.W. $\frac{1}{2}$ W.; then run in with this mark on, until you are $\frac{1}{2}$ of a mile past the Beach End buoy, and get the cupola of Landguard Fort to bear E. by N., when you will have the Altar buoy bearing N.N.E., and the Cliff Foot Rocks W. $\frac{1}{2}$ S., and will be at the entrance of the channels.

The EASTERN and usual CHANNEL, after passing the Beach End buoy, leads close round to the westward of the Altar buoy; then crosses the Altar Flat, in 12 feet at low water, spring-tides: when, following the Suffolk shore, it leaves all the rest of the shoals to the westward.

From abreast of the Andrews buoy, steer to the westward, so as to bring the high lighthouse its own breadth open west of the low lighthouse; run in upon that line, passing to the westward of the Beach End buoy, and hauling close round the Altar buoy. If the latter should not be seen, it will have been passed when the East Martello tower on Landguard beach, opens north of the black boat-house. Now steer over to the Suffolk shore, about E.N.E. and northerly, till the flagstaff and cupola of Landguard Fort come in one, S. $\frac{1}{2}$ E. This mark leads through the rest of the channel, till the black granary comes in one with Walton gravel-pit, E. $\frac{1}{2}$ N. From thence a W. by N. course clears the Bone and Gristle, and leads to Harwich anchorage.

To work in, keep the high lighthouse open west of the low lighthouse. Stand towards the Halliday Flats by the lead, and towards Cliff Foot, till East Shotley Martello tower comes within its own breadth of the Ordnance pile jetty, N. by W. In standing towards the Altar, tack before the lighthouses come in one. In turning to the eastward across the Altar Flat, after rounding the Altar buoy, stand to the southward till the East Martello tower comes in one with the black boat-house; and to the northward, keeping Dover Court mill well open of the Beacon cliff. The clearing mark, when standing to the Glutton and Bone, is the flagstaff between the two western stacks of chimnies in Landguard Fort; but this leads nearer the Bone than the Glutton.

The Suffolk beach may be approached generally within a cable's length, except near Walton ferry, where cement heaps are strewn about the shore. In working towards the town, when standing to the southward, keep Walton gravel-pit open to the northward of the black granary; but the Shotley shore may not be approached till the two Walton mills and the Walton Martello tower are in one.

The WESTERN CHANNEL is the most direct; it leaves the Altar buoy, as well as the four small shoals, to the eastward, and follows along the edge of the Guard, or Harwich Shelf, carrying every where 2 fathoms, except on a small knoll, of 11 feet. This channel can only be taken with a leading wind, or a steam-vessel.

DIRECTIONS.—From the fairway between the Altar and Cliff Foot buoys, stand about N.N.E., till two small white beacons under Fagsborough cliff, come in one, bearing N. by E. $\frac{1}{2}$ E., and they will lead fairly in, till another small white beacon and Shotley Martello tower are in one, about N.W. $\frac{1}{2}$ N.; then hard-a-starboard the helm, in order to place the vessel's head on the latter mark, which leads midway between the Guard and Gristle, to the anchorage off the town.

Besides the above, there is a DEEP-WATER CHANNEL, of 19 feet at low water, springs, close round Landguard point; but it is so narrow at present, that for a frigate, buoys or boats must be placed on either side.

When rounding Shotley point, in order to cross from the Stour to the Orwell, keep the top of the high lighthouse open to the eastward of Harwich steeple, about midway along the roof of the Church, bearing S.S.W. $\frac{1}{2}$ W.; or keep the low lighthouse well open of the Ordnance pile jetty. Either of these marks will clear the Horse Bank, in 12 feet at low water.

The best anchorage in Felixstow Road is, with Baudsey Church about twice its breadth to the west of the highest top of Baudsey cliff, where the signal house stands, in $4\frac{1}{2}$ fathoms water.

The best anchorage in the Pitching Ground is, with Orford Castle thrice the distance between the church and the castle, to the S.E. of Baudsey cliff, in 5 fathoms water.

The best anchorage in the Rolling Ground is, Baudsey cliff, on with Felixstow cliff; and Harwich low lighthouse, about half-way between the church and the high lighthouse, in 5 fathoms water.

The Rough Channel is between the Cork Sand, Ledge, and Spit, on one side, and the Cork Knot and Wadgate Ledge on the other. Vessels navigating this channel must bring the high lighthouse of Harwich just open to the right of Landguard Fort, bearing N.W. by W., and keep this mark on until Baudsey church bears N.E. $\frac{1}{4}$ E. This will then carry them to the entrance of the Pitching Ground, when they should proceed as before directed. To sail to the eastward of the Rough, bring Baudsey Church in one with the sea-mark on Baudsey cliff, bearing N. $\frac{1}{4}$ W.

THROUGH GOLDMER'S GAT, OVER THE NAZE FLATS, TO HARWICH.

Description of the Shoals, Buoys, &c.

THE NAZE FLATS extend a considerable way to the eastward, and join the West Rocks. Large ships bound over them for Harwich, should be particularly careful of the tides, that the rise of water may be sufficient to carry them safely over.

The passage over the Flats is called the Medusa Channel, having on its western side the *Naze Ledge, South, Middle, and North Bars, the Pye and Halliday Sands, and Cliff Foot Rock*; while to the eastward, are the *Stone Banks* and the *Ridge*.

THE NAZE LEDGE is a *rocky shoal*, which stretches out a full mile to the eastward of the land, having from 6 to 3 feet over it; the shallowest part being nearest the shore. Its south-eastern extremity bears from the Naze tower S.E. $\frac{1}{4}$ E., distant $1\frac{1}{2}$ mile, with 2 fathoms water upon it.

SOUTH, MIDDLE, and NORTH BARS.—These *rocky ridges* run to the northward of the Ledge, and are of irregular forms and unequal depths, having over them from $\frac{1}{4}$ to $1\frac{1}{2}$ fathom.

THE PYE SAND is a long narrow strip, stretching out E.N.E., $1\frac{1}{2}$ mile from Walton stone point, which is the southern point of the entrance to Horsey or Handford water. It is dry at low water, and almost so at half-ebb. Its extreme point lies with Harwich cliff N.N.E., distant $1\frac{1}{2}$ mile; and Dover Court Church on with a farm-house N.N.W. $\frac{1}{4}$ W.

THE HALLIDAYS are to the northward of the Pye Sand, and form the northern boundary of the entrance to Handford. They dry at low water, but do not stretch out so far to the eastward as the Pye Sand.

THE CLIFF FOOT ROCK lies about a mile outside Harwich cliff, having only 2 feet on its shoalest part. This and the above, as before observed, all lie on the western side of the channel.

THE STONE BANKS are those irregular and extensive *banks* which lie between the Naze Ledges and the West Rocks; having over them from 7 feet to 3 fathoms. A black buoy, with a white cross on its top, and a white band painted round its top and middle, is placed upon the Stone Banks, in $2\frac{1}{2}$ fathoms water; from which the Naze tower bears W. by S.; Harwich high light N. $\frac{1}{4}$ W.; and Dover Court Church N.N.W. $\frac{1}{4}$ W.

THE HORN is a small *rocky spot*, with only 6 feet over it, lying S. by W. $\frac{1}{4}$ W., about $\frac{1}{2}$ a mile from the west end of the Ridge; S.E. by E. $\frac{1}{4}$ E., a mile from the N.E. end of the Pye Sand; and N. $\frac{3}{4}$ E., $1\frac{1}{2}$ mile from the Stone Banks buoy.

DIRECTIONS FOR SAILING OVER THE NAZE FLATS TO HARWICH, THE WALLET, &c.

VESSELS proceeding through Goldmer's Gat, should bring Walton Hall just open to the right of the Naze Tower, bearing N.W. $\frac{1}{4}$ N.: run along with this mark on, until the high light of Harwich comes N. $\frac{1}{4}$ E., and in a line with Blackman's Head, which is the east side Harwich cliff; you will then be at the entrance of the Medusa Channel, and should bring a large red brick house, at Walton Ferry brick-kilns, within Land-

guard Fort, about half its length open to the left of the high water-mark of Landguard point, bearing N. by E. $\frac{3}{4}$ E. This is the leading mark through the Medusa Channel to the Rolling Grounds, where you may anchor, in $4\frac{1}{2}$ to 5 fathoms water, with the tower behind Landguard Fort on with the S.E. corner of the Fort, in 3, 4, or 5 fathoms; or with Baudsey and Felixstow cliffs in one, and Harwich low light nearly midway between the Church and high light, bearing N. by W. $\frac{1}{4}$ W.; these are the marks for the best anchorage. You may then proceed for the harbour, as before directed. In this passage, care must be taken to wait until you are well assured that you will have sufficient water to carry you over the Naze Flats.

The Gullet Channel is to the eastward of the Medusa Channel, and runs between the Stone Banks and West Rocks. In it your least depth of water will be 9 feet, the mark being Dr. Frank's white house, near Alderton Church, its own length over the low west end of Baudsey cliff, bearing N.E. $\frac{1}{4}$ N.; but this mark is not easily to be made out by a stranger. Continue in this direction, until the lighthouses are in one, bearing N.W. by N.; and then proceed with this mark to the Rolling Ground, between the buoys of the Ridge and Andrews. When abreast of the Andrews, steer to the westward, so as to bring the high lighthouse its own breadth open west of the low lighthouse, bearing N.N.W. $\frac{1}{4}$ W.

THE WALLET.—The Wallet is a space or channel lying between the Gunfleet Sand and the shore, and extending from the Gunfleet buoy to the Buxey. On its northern side it is rendered shallow by a *bank* or *flat*, which extends all the way from the West Rocks to the Buxey; the deepest water will therefore be found on its southern or Gunfleet side.

There are two entrances to the Wallet; the eastern entrance is through Goldmer's Gat, and the western entrance is from the East Swin through the Spitway.

The mark for the eastern entrance, or Goldmer's Gat, is Walton Hall just open to the right of the tower, bearing N.W. $\frac{1}{4}$ N. The western entrance is between the Buxey and Gunfleet, and is pointed out by two buoys, as already described.

About $3\frac{1}{2}$ miles from the Gunfleet buoy, is a large part of the Gunfleet which dries, being covered about $2\frac{1}{2}$ hours of flood, called the East Knock. Farther on are two other *patches*, which dry with low spring-tides. And at the farther end of the Gunfleet, near the Spitway, is the West Knock, which is covered at half-flood. Between these are swashways, of 2 and 3 feet water.

COPPERAS BANK.—The *flat* which stretches along the main land from the West Rocks to the Buxey, extends itself from 1 to 2 miles off shore. W. $\frac{1}{4}$ N., 6 miles from the Gunfleet buoy; S.W. by S., $4\frac{1}{2}$ miles from Walton tower; and N.N.W. $\frac{1}{4}$ W., $2\frac{1}{2}$ miles from the Gunfleet beacon, lies the eastern end of the *Copperas Bank*, running from thence $1\frac{1}{4}$ mile W.N.W. $\frac{1}{4}$ W.; and the middle of the bank lies directly south from Great Holland Church, distant $2\frac{3}{4}$ miles. The battery at Burnthouse cliff brought N.N.E., clears its eastern end. The deep-water channel of the Wallet is here but $1\frac{1}{4}$ mile wide. On the Copperas Bank are $3\frac{1}{2}$ fathoms, and within it, 4, 3, 2, and 1 fathom, shallowing as you approach the main. Between it and the Gunfleet, are 5, 6, and 7 fathoms.

TRIPOD.—W.N.W. $\frac{1}{4}$ W., $2\frac{1}{2}$ miles from the west end of the Copperas Bank, is the *Tripod*, a triangular *shoal*, nearly dry at low water, lying about $\frac{1}{2}$ a mile from the shore.

ELBOW.—W. $\frac{3}{4}$ S., $1\frac{1}{4}$ mile from the west end of the Copperas Bank, is the Elbow, with $3\frac{1}{2}$ fathoms, and $4\frac{1}{2}$ near its southern side. This bears nearly S.E. from the Tripod, distant a mile.

RUNCH.—W. by S. from the Elbow, $1\frac{1}{2}$ mile, is the *Runch Bank*, having $3\frac{1}{2}$ fathoms upon it, $4\frac{1}{2}$ within side, and 5, 6, and 7 fathoms to the southward; it is $\frac{3}{4}$ of a mile long; its western end bears from the inner buoy of the Spitway N.E. $\frac{1}{4}$ E., distant $2\frac{3}{4}$ miles.

To the westward of the GUNFLEET, about $3\frac{1}{4}$ or 4 miles above the eastern buoy, you will have exceedingly good riding, with S.E., southerly, and S.W. winds, under shelter of the East Knock. When in the King's Channel, being abreast of the buoy on the Gunfleet, with a S.W. wind, and thinking bad weather to be coming on, your best method will be to work up to the northward of the sand, to the distance above mentioned, anchoring in 5 or 6 fathoms, where you will have better riding with $\frac{1}{2}$ a cable on the small bower, than you would have had with both anchors a-head, and

whole cables out, on the south side of the sand. Vessels having passed through the *Swin Spitway* into the *Wallet*, will, by pursuing a direct E.N.E. course from the north buoy of the *Spitway*, go between the *Copperas Bank* and the main, to the entrance of the *Medusa Channel*. A more easterly course will take them to the southward of the bank, and in deeper water.

To sail out through the *Gat*, bring the *Naze Tower* N.W. $\frac{1}{2}$ N., and with flood tide steer S.E. by E., with ebb S.E. by S., or according to wind and tide, and the above mark will lead into 4 $\frac{1}{2}$, 6, and 7 fathoms. In working out from the *Wallet*, you may stand to the northward, until *Walton Hall* comes on with the *Tower*, and towards the *Gumfleet*, into 5 fathoms.

FROM ORFORDNESS TO YARMOUTH ROADS.

Description of the Sand Banks, Buoys, &c.

THE land about Orfordness is low; and the *shoals* in its vicinity are the *Onion*, *Nathaniel's Knoll*, the *Ridge*, *Aldborough Knapes*, and the *Sizevell Bank*.

THE ONION is a *shelf*, or *flat*, which runs out from abreast of Orfordness lower lighthouse, and extends a full cable's length from the point.

NATHANIEL'S KNOLL nearly joins the *Onion*, and was frequently called the *Onion* by the coasters. It is a small narrow *shoal*, running in a N.E. direction, about $\frac{1}{2}$ a mile. Its southern part has 12 feet water over it, and lies E.N.E. $\frac{1}{2}$ E. from the high light, and E. by S. from the low light, distant from the latter $\frac{1}{2}$ of a mile. On the middle of the knoll were 9 feet, and on its northern end 2 fathoms. Between this knoll and the *Onion* was a small passage, with from 16 feet to 4 fathoms water in it; and on the eastern side of the knoll were 5 and 6 fathoms. A black buoy, with the words "*Nathaniel's Knoll*" painted on its head, was placed on the outer edge of this shoal, in 3 $\frac{1}{2}$ fathoms; but the shallows mentioned, both on the *Knoll* and *Onion*, having been washed away, and the depth increased, the black buoy has been taken away.

THE RIDGE is an oval-shaped *sand*, extending above $\frac{1}{2}$ a mile N.E. by E., its greatest breadth being less than $\frac{1}{4}$ of a mile, and its least water 2 fathoms. A black buoy is placed on its outer edge, in 4 fathoms water, about 2 $\frac{1}{2}$ miles distant from Orfordness Point, with *Snape Church* to the left of a *Martello* tower near *Slaughden House*, bearing N.N.W. $\frac{3}{4}$ W.; Orford Church and Castle just open of each other, west; and Orfordness high light W.S.W. In consequence of the growing up of this sand to the south-eastward, on which part there are only 13 feet at low water, an additional buoy has been laid on the S.E. edge, abreast of that shoal, and lately removed to a position farther eastward, and now lies with Orfordness high lighthouse W.S.W.; Aldborough Church N. $\frac{1}{4}$ E.; Aldborough Knapes buoy E. $\frac{1}{2}$ S.; and Orford Church and Castle in one, W. $\frac{1}{2}$ N.

The *Onion*, *Nathaniel's Knoll*, and the *Ridge*, may now be considered as a continuation of the same shoal, extending E.N.E., 3 $\frac{1}{2}$ miles from Orford high light, having from 1 $\frac{1}{2}$ to 4 fathoms over it.

A *sandy flat*, of 4 fathoms, lines the shore of Aldborough Bay, and stretches from abreast of the *Martello* tower, all the way to *Thorpe Ness*.

ALDBOROUGH KNAPES extends N.E. and S.W., 2 $\frac{1}{2}$ miles, from the depth of 5 fathoms at each end. This shoal is about $\frac{1}{4}$ of a mile broad, and has only 2 $\frac{1}{2}$ fathoms over the middle, and 4 near each end. The N.E. end lies with Aldborough Church W.N.W. $\frac{1}{2}$ W., distant 4 miles, and Orford low light W.S.W. $\frac{1}{2}$ W., 6 $\frac{1}{2}$ miles; its S.W. end lies with Aldborough Church N.W. by N., distant 3 $\frac{3}{4}$ miles, and Orford low light W. $\frac{1}{4}$ S., 4 miles.

ALDBOROUGH BUOY.—There is a black-and-white chequered buoy placed near the eastern edge of the sand, in 5 fathoms water, from which Aldborough Church bears N.W.; Orford high light W. $\frac{3}{4}$ S.; Orford Church and Castle in one, W. $\frac{1}{4}$ N.; and Iken Church, which has a tower-steeple, N.W. by W., at $\frac{1}{3}$ of the apparent distance from Aldborough Town to *Slaughden House*. Orford Church and the ruins of the Castle a sail's breadth open either way, will clear the *Knapes* to the eastward or west-

[NORTH SEA.]

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ward; Iken Church, midway between Slaughden House and the Martello tower, N.W. $\frac{1}{4}$ W., will clear it to the southward; and Leiston Church on or open of Thorpe House, N.W. by N., nearly, will clear it to the northward. Between the Ridge and Aldborough Knapes there are 9, 10, and 11 fathoms, sandy bottom.

SIZEWELL BANK has, within these few years, considerably increased, and now forms a *shelf*, $\frac{2}{3}$ of a mile broad, from the south part of Aldborough Town, nearly 6 miles to the north-eastward; the depths over it varying from 4 to 2 $\frac{1}{2}$ fathoms, but with only 9 feet at low water over its shoalest part, which lies E.N.E. $\frac{1}{4}$ E., $1\frac{1}{2}$ mile from Thorpe Ness, and 4 $\frac{1}{2}$ miles S. by W. from Dunwich Church. The N.E. part of the bank, in 4 fathoms, lies with Blythborough and Dunwich Churches in a line, bearing N. $\frac{1}{4}$ W. You will clear this part by keeping Blythborough Lodge (a farm-house standing in the midst of a grove of trees,) open to the eastward or right of Dunwich Church. Orford Castle open to the southward of Aldborough Town, or bearing S.W. by W. $\frac{3}{4}$ W., will lead clear to the eastward of this bank. The shore about Thorpe Ness is rocky. Between it and the south end of Sizewell Bank, are 9, 12, and 15 feet; thence, towards the north end of the shoal, are from 3 to 4 fathoms, excepting the shoal of 9 feet.

SIZEWELL BUOY.—A buoy, coloured black-and-white, in circles, marked “Sizewell Bank,” lies upon the eastern edge of this shoal, in 4 $\frac{1}{2}$ fathoms, with Lieston Church, midway between the Preventive Station House and a red-tiled farm-house and barn, at Sizewell, bearing N.W. by W. $\frac{1}{4}$ W.; Dunwich Church N. by E.; Orfordness lights S.W. $\frac{1}{4}$ W.; and Aldborough Church W. by S. $\frac{1}{2}$ S.

From Thorpe Ness a *sandy flat* continues along shore all the way to the *Barnard Sand*, the water shallowing gradually towards the land. S.E. of the town of Dunwich is the south end of a *sandy shoal*, called the *Dunwich Bank*, having from 4 to 3 $\frac{1}{2}$ fathoms over it; its inner edge is distant from the coast $1\frac{1}{2}$ mile; it runs nearly in the direction of the land, and is about $1\frac{1}{2}$ mile in length and $\frac{1}{3}$ of a mile broad; within it are 5 $\frac{1}{2}$, 4 $\frac{1}{2}$, and 5 fathoms water; and on its outside 5, 6, 7, and 10 fathoms. Covehithe Church well open to the eastward of the low N.E. end of Easton cliff, will clear it from the northward, and Aldborough Church open of Thorpe Ness, will clear it from the southward, to the eastward of the bank, in 5, 6, or 7 fathoms. This part is called Sole Bay.

The BARNARD commences from the shore off Covehithe Ness, and thence extends about N.E. $\frac{1}{2}$ N., 2 $\frac{1}{2}$ miles; it is $\frac{1}{4}$ of a mile broad, with only 4 feet on its shallowest part at low water, being steep-to on its eastern side. Midway from the sand and the shore are from 4 to 5 fathoms. The Barnard is joined to the Newcome by a *ridge*, about $\frac{1}{2}$ a mile wide, with 3 to 3 $\frac{1}{2}$ fathoms on it; over this ridge vessels pass from the southward to Lowestoff South Roads.

According to a Trinity House notice, dated 13th August, 1840, a narrow channel has opened between Covehithe Point and the south end of the Barnard Sand, at which time two buoys had been laid down, to facilitate the passage of such vessels as may, under circumstances of emergency, be induced to avail themselves of this passage. The buoys are placed in the following situations, viz.:—a black beacon-buoy, marked “South Inner Barnard,” on the inside of the south end of that sand, in 15 feet at low water, spring-tides, with the chimney of a farm-house on the back land, just touching the outermost tree of Covehithe wood, W. by S.; Lowestoff Church, its length open eastward of a gap in Kirkley cliff, N.N.E.; S.W. Barnard buoy N.E. by E.; and Southwold Church W. by S. $\frac{1}{2}$ S. A striped black-and-white buoy, marked “Covehithe Point,” in 15 feet water off that point, with a farm-house on with the extreme end of Covehithe wood, W. by S. $\frac{1}{4}$ S.; Lowestoff Church steeple, on with the gap in Kirkley cliff, N.N.E. $\frac{1}{4}$ E.; Southwold Church W. by S. $\frac{3}{4}$ S.; Covehithe Church W.N.W.; and Kessingland Church, north. The above buoys bear from each other W. by S. $\frac{1}{4}$ S. and E. by N. $\frac{1}{4}$ N., and the width of the channel is 180 fathoms.

BARNARD SOUTH-WEST BUOY, painted red, is laid on the S.W. end of the Barnard Sand, in 6 fathoms, with Southwold Church tower, twice its apparent breadth open southward of the houses upon Easton Ness, bearing S.W. by W. $\frac{1}{2}$ W.; Lowestoff Church, on with the highest windmill at Kirkley, N.N.E.; Covehithe Church tower W. $\frac{1}{4}$ N.; and Kessingland Church tower N. by W. To lead clear of this end of the Barnard, keep Southwold Church at least twice its apparent breadth to the left of Easton houses, which stand within Easton cliff.

BARNARD NORTH BUOY.—A black-and-white chequered buoy, with staff and ball, is laid on the N.E. end of the Barnard Sand, in 3 fathoms, with Southwold Church

on with Easton Ness point, S.W. $\frac{1}{2}$ W.; Kessingland Church W. by N. $\frac{1}{2}$ N.; Lowestoff Church N. by E.; and Pakefield Church north, a little westerly.

PAKEFIELD LIGHTHOUSE.—This lighthouse, which was established by the Trinity House, in 1832, is situated a mile to the south-westward of Pakefield Church; it is a white tower, 23 feet high, on which is a fixed light, elevated 68 feet above the level of the sea, and is visible 5 leagues off, from S.E. by E. $\frac{1}{2}$ E. to S.E. $\frac{1}{2}$ S. This light is intended to lead vessels between the Barnard and Newcome Sands, into and out of the Lowestoff South Roads.

It having been found that vessels coming from the southward, and bound into Lowestoff Roads, had been led into situations of danger, by mistaking the light from the windows of houses upon the cliff at Kessingland, for the Pakefield light, the Trinity House, according to a notice dated April 22nd, 1835, have ordered, that the light from the lighthouse should in future be red, instead of white, as formerly.

As the soundings, in approaching the coast from the sea to the northward of Lowestoff, are very irregular, and the soundings off Lowestoff so regular, that they may be depended on, ships, when coming from seaward, should endeavour to make the land in the latitude of Lowestoff, which is $52^{\circ} 29'$ north. In this latitude they may steer boldly in by night or day, until they come into 17 or 16 fathoms; for in the night-time, the lights may be seen 3 or 4 leagues off; and in day, the church and upper part of the town may be discovered at the distance of 7 leagues, if the weather be clear.

Shoals and Buoys, &c. in the vicinity of Lowestoff and Yarmouth.

The LOWESTOFF NEWCOME is a narrow ridge of sand, lying in a S.W. by S. and N.E. by N. direction, and forming the western side of the Stanford Channel, and the eastern side of the Lowestoff South Road; its southern end being about a mile distant from the Lowestoff shore, and its northern end rather more than $\frac{1}{2}$ a mile from the Ness point. This shoal having shifted its position, additional buoys are placed upon it.

INNER LOWESTOFF SHOAL.—This shoal has lately grown up, and lies between the entrance to Lowestoff Harbour and the South Ness, at about $\frac{1}{2}$ of a mile from the shore. It has on it from 11 to 15 feet; and a black-and-white chequered buoy is placed on its eastern edge. An additional black buoy has lately been placed on its western edge.

LOWESTOFF INNER CHANNEL.—Vessels from the southward may use the Lowestoff Inner Channel, where buoys have been placed for their guidance; these consist of four black buoys on the western edge of the Newcome, which, in proceeding northward, are to be left on the starboard or eastern side; and the inner shoal buoys may also be left on the starboard side, having 17 feet at low water within them. The following are the marks and bearings of the buoys:—

SOUTH NEWCOME (black), with staff and ball, lies $1\frac{1}{2}$ mile N.N.E. $\frac{1}{4}$ E. from the chequered buoy on the N.E. end of the Barnard. From this buoy Pakefield lighthouse bears W. by N. $\frac{1}{2}$ N.; and Pakefield windmill, in a line with the N.E. end of a barn on the cliff, N.N.W. $\frac{1}{4}$ W.

S.W. NEWCOME (black) lies in 4 fathoms, at $\frac{1}{2}$ a mile north from the Newcome south buoy, with Pakefield lighthouse bearing W. $\frac{1}{4}$ S.; and Lowestoff mill, in a line with the centre of the harbour-master's house, N. by E. $\frac{1}{4}$ E.

N.W. NEWCOME (black) lies in 4 fathoms, at $\frac{3}{4}$ of a mile N.N.E. $\frac{3}{4}$ E. from the Newcome S.W. buoy, with Pakefield lighthouse S.W. by W. $\frac{3}{4}$ W.; and Lowestoff low lighthouse N.N.E. $\frac{1}{4}$ E.

NORTH NEWCOME (black) lies in $3\frac{1}{2}$ fathoms, at nearly $\frac{3}{4}$ of a mile N.E. by E. from the N.W. buoy, with Lowestoff lower lighthouse N. $\frac{1}{4}$ W.; Lowestoff Church spire, in a line with the N.E. end of Lowestoff Preventive Station House, N. by W. $\frac{1}{2}$ W.

The **INNER SHOAL BUOY** (chequered black-and-white) has lately been removed $1\frac{1}{2}$ cable's length in a S.E. direction, and now lies, in $2\frac{1}{2}$ fathoms, with Lowestoff Church spire N.W. $\frac{1}{2}$ N.; Pakefield mill W. by S. $\frac{1}{2}$ S.; and the inner shoal buoy (black) W. $\frac{1}{2}$ N.

WESTERN INNER SHOAL BUOY is black, and lies in 11 feet water, with Lowestoff low lighthouse N. by W. $\frac{1}{2}$ W., and the inner shoal chequered buoy E. $\frac{3}{4}$ S.

SAILING DIRECTIONS FROM

STANFORD LIGHT-VESSEL, which carries two lights, placed horizontally, 23 feet above the sea, visible 3 leagues off, lies with Corton Church and windmill in one, and Pakefield windmill, in line with the northernmost house in Pakefield; and with high light N.N.W. $\frac{1}{2}$ W.

LOWESTOFF NEW HARBOUR.—Between Pakefield and Lowestoff is the new harbour, being about $\frac{1}{4}$ of a mile to the south-westward of the low water mark. The harbour is formed by Lake Lothing, now connected with the sea on the east, and by means of new cuts and canals westward, with the Rivers Waveney and Ouse communicating with the City of Norwich, and which is now enabled to receive vessels of 200 tons burthen.

STANFORD CHANNEL.—In June, 1836, the Old Stanford Channel became so shoal by the continual shifting of the sands in this neighbourhood, as to render it, almost impossible to navigate; and accordingly the then buoys were taken up, and a new channel buoyed, as before described. But in the early part of 1846, some alterations, which had then been for a considerable time in progress, were made in the Newcome and Holm Sands, having rendered the Stanford Channel again navigable, notice thereof was given, that the Corporation of Trinity had caused the buoys to be buoyed out.

On the 2nd of April, 1846, it appears that the East Newcome buoy (red) and the Holm buoy (black) have been moved in a southerly and westerly direction, and the buoys are now placed at the following marks and bearings, viz.:—

The East Newcome buoy is in a line with Lowestoff low lighthouse, in line with the Holm buoy, and in a line with Pakefield Church, midway between Pakefield Church and the Holm buoy N.W.; South Holm buoy E.S.E.; Stanford light-vessel N. by E. $\frac{1}{2}$ E.

The Holm buoy is in a line with the chancel end of Lowestoff lighthouse, in a line with the Preventive Station, N. by E. $\frac{1}{2}$ E. and in a line with the Holm Hook buoy N.N.E. The Holm buoy is in a line with the Holm Hook buoy N.N.E. and in a line with the Holm Hook buoy N.N.E.

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"Middle Corton," has been placed thereon, in $3\frac{1}{2}$ fathoms, with Lowestoff Church S.W. by W. $\frac{1}{2}$ W.; West Corton buoy N.E.; and the S.W. Corton buoy, south.

S.W. CORTON (chequered black-and-white) in 5 fathoms, lying S.S.W., $1\frac{1}{2}$ mile from the West Corton buoy, with Lowestoff high light W.S.W. $\frac{3}{4}$ W.; and Corton Church N.N.W. $\frac{1}{4}$ W. The buoy, marked "Holm Hook," before described.

S.E. HOLM (black) lies in $6\frac{1}{2}$ fathoms, with Lowestoff Church spire, in a line with the low lighthouse, N.W. by N.; Pakefield Church Tower, its length open south of Pakefield windmill, W. by N.; and the N.E. Holm buoy N.E.

MIDDLE HOLM (black), in 8 fathoms, with Lowestoff mill, in line with the northernmost house at Lowestoff, bearing N.W. by W. $\frac{1}{4}$ W.; Nelson's Monument, in line with the highest mill west of Yarmouth, N. $\frac{1}{4}$ W.; S.E. Holm buoy S.W. by W., westerly; and N.E. Holm buoy N.E. by N.

N.E. HOLM (black), in 8 fathoms, with Lowestoff mill, in line with the north part of Lowestoff battery, west; Gorleston north mill, in line with Yarmouth south pier-head, N. by W. $\frac{1}{2}$ W.; and S.E. Corton N. $\frac{1}{4}$ E.

S.E. CORTON (black), in 6 fathoms, with the chancel of Gorleston Church, in line with the pilot-house on south pier-head, N.N.W. $\frac{1}{4}$ W.; Lowestoff windmill, apparently midway between Lowestoff Church and a grove of trees, W. by S. $\frac{3}{4}$ S.; and N.E. Corton buoy N. $\frac{1}{2}$ W.

N.E. CORTON (black), in 5 fathoms, with Lowestoff high light S.W. by W.; and the S.E. Corton S. $\frac{1}{2}$ E., distant a mile.

CORTON SPIT (black), in 4 fathoms, with Corton Church W. by S. $\frac{1}{4}$ S.; and the N.E. Corton S. $\frac{1}{2}$ E., distant $\frac{3}{4}$ of a mile.

N.W. CORTON (black), in $2\frac{3}{4}$ fathoms, with Yarmouth Church, in a line with a high mill, (Harrison's) and the new bathing house north of the jetty, N. by W.; St. Nicholas light-vessel N. $\frac{1}{2}$ E.; Corton spit buoy S. $\frac{3}{4}$ E.; and South Scroby buoy E.S.E.

The chief passage into YARMOUTH ROADS, for ships of great draught of water, has always been between the Corton Sand, on the western side, and St. Nicholas Bank, or Kettle Bottom, on the eastern side, generally called St. Nicholas Gat. This channel is pointed out by three black buoys on the eastern edge of the Corton Sand, (before described,) and a red buoy and a light-vessel on the western edge of the St. Nicholas Bank. It is about $\frac{1}{3}$ of a mile wide, with a depth of from $5\frac{1}{2}$ to 6 fathoms at low water.

ST. NICHOLAS BANK, or KETTLE BOTTOM, is a long narrow sand, about $1\frac{1}{2}$ mile in length from south to north, having on it from $2\frac{3}{4}$ to 3 fathoms, and marked out by the following buoys and a light-vessel:—

Trinity House Notice, London, April 2nd, 1846.—In order to facilitate the navigation into and out of Yarmouth Roads, through the wide and deep-water channel between the Scroby and St. Nicholas, or Kettle Bottom Sand, commonly called Hewett's Channel, the St. Nicholas light-vessel has been moved to the position previously occupied by the red buoy, at the southern end of St. Nicholas (otherwise Kettle Bottom) Sand; and that the said red buoy has been placed about $\frac{1}{2}$ of a mile to the southward of the position from which the said light-vessel has been removed: also that the chequered buoy on the south end of the Scroby Sand has been replaced, in precisely the same spot, by a black beacon nun-buoy, of a large size.

ST. NICHOLAS LIGHT-VESSEL, as now placed, is moored in $4\frac{1}{2}$ fathoms, with the following marks and bearings, viz.:—Yarmouth New Church, in line with Victoria Terrace, N. by W. $\frac{3}{4}$ W.; the south part of the Grove, touching the north side of the fence of Nelson's Monument, N.W. $\frac{3}{4}$ N.; the second house north of Gorleston south mill, in line with the inner part of Gorleston south pier, N.W. by W. $\frac{1}{4}$ W.; South Scroby buoy S.E.; Scroby Fork buoy N.E. $\frac{1}{4}$ N.; North St. Nicholas buoy N. $\frac{3}{4}$ E.; and N.W. Corton buoy W. by S.

The RED BUOY, called the south buoy of St. Nicholas, as now placed, lies in $3\frac{1}{2}$ fathoms, with Yarmouth Old Church, in line with the outer part of Yarmouth Jetty, N. by W. $\frac{1}{4}$ W.; Gorleston south mill, in line with the inner part of Gorleston south pier, N.W. by W.; St. Nicholas light-vessel S.E.; North St. Nicholas buoy N.N.E.; and N.W. Corton buoy S. by W.

NORTH NICHOLAS (black), with staff and ball, has lately been removed, in a southerly direction, and now lies in $4\frac{1}{2}$ fathoms, with Yarmouth Old Church N.N.W. $\frac{1}{4}$ W.; Scroby Fork buoy S.E. by E. $\frac{3}{4}$ E.; and the S. W. Scroby buoy N.N.E. $\frac{1}{4}$ E.

STANFORD LIGHT-VESSEL, which carries two lights, placed horizontally, 23 feet above the sea, visible 3 leagues off, lies with Corton Church and windmill in one, N. $\frac{1}{4}$ W.; Pakefield windmill, in line with the northernmost house in Pakefield; and Lowestoff high light N.N.W. $\frac{1}{4}$ W.

LOWESTOFF NEW HARBOUR.—Between Pakefield and Lowestoff is the entrance to this harbour, being about $\frac{1}{4}$ of a mile to the south-westward of the low lighthouse. The harbour is formed by Lake Lothing, now connected with the sea on the east, and by means of new cuts and canals westward, with the Rivers Waveney and Yare, thus communicating with the City of Norwich, and which is now enabled to receive vessels of 200 tons burthen.

STANFORD CHANNEL.—In June, 1836, the Old Stanford Channel became so shallow, by the continual shifting of the sands in this neighbourhood, as to render it, at that time, unsafe to navigate; and accordingly the then buoys were taken up, and the Lowestoff Inner Channel buoyed, as before described. But in the early part of 1843, from the recent alterations, which had then been for a considerable time in progress in and about the Newcome and Holm Sands, having rendered the Stanford Channel again navigable, notice thereof was given, that the Corporation of Trinity had caused the said channel to be buoyed out.

By a Trinity House Notice, dated London, 2nd April, 1846, it appears that the East Newcome and South Holm Sands having shifted, the East Newcome buoy (red) and the South Holm buoy (black) have been moved in a southerly and westerly direction, and now lie nearly 2 cables' length distant from each other, with 14 and 15 feet water between them, and with the following marks and bearings, viz.:—

EAST NEWCOME BUOY (red) lies in 2 $\frac{1}{4}$ fathoms, with Lowestoff low lighthouse, in line with a high chimney at that place, N. $\frac{1}{4}$ W.; Pakefield Church, midway between Pakefield mill and a red-tiled house, W.N.W.; South Holm buoy E.S.E.; Stanford light-vessel N. by E. $\frac{3}{4}$ E.; and Holm Hook buoy N.E. by N.

SOUTH HOLM BUOY (black) lies in 2 $\frac{1}{4}$ fathoms, with the chancel end of Lowestoff Church, touching the red-tiled building to the left of the Preventive Station, N. by W. $\frac{1}{4}$ W.; Pakefield Church, midway between Pakefield mill and a red-tiled house, W.N.W.; Stanford light-vessel N. by E. $\frac{1}{4}$ E.; and Holm Hook buoy N.N.E.

The above two buoys mark the southern entrance of the channel, and lie 2 cables' length apart.

A black-and-white chequered buoy on the west hook of the Holm, marked "Holm Hook," in 6 fathoms, with Lowestoff Church Tower, in line with Lowestoff low lighthouse, N. W. by N.; a six-vane windmill, west of Kirkley, in line with Kirkley north windmill, N.W. by W. $\frac{1}{4}$ W.; Stanford light-vessel N. by W. $\frac{3}{4}$ W.; and S.W. Corton buoy N. by E. $\frac{3}{4}$ E.

Mariners are to observe, that the tides in the Stanford Channel set N.E. and S.W., and that the light-vessel must always be passed to the eastward. The course through the channel is N. by E. $\frac{1}{4}$ E. and S. by W. $\frac{1}{4}$ W., nearly.

The HOLM and CORTON SANDS lie to the eastward and northward of the Newcome and the Stanford Passage. The *Holm* is a large *sandy flat*, which dries in some parts, and now joins an extensive *bank*, called the *Corton*. These sands stretch along in a direction parallel to the shore, full 6 miles, and form the eastern boundary of Lowestoff and Corton Roads. Several parts of the latter dry at low water, especially one patch, which is 6 feet high at low water spring-tides, at 1 $\frac{1}{4}$ mile S.E. by S. from Lowestoff low light. On the west side of the Corton are three black-and-white chequered buoys; and on the eastern side of the Holm and Corton, are six black buoys (in addition to the one marked "South Holm," and described before), laid down with the following marks and bearings:—

WEST CORTON (chequered black-and-white) in 5 fathoms, with Yarmouth Church just open to the eastward of a white house situated on the south part of Yarmouth Denes, N. $\frac{1}{4}$ E.; Lowestoff low light, over a fish-house on Lowestoff Denes, S.W. $\frac{1}{4}$ S.; and Corton Church steeple, over a red-tiled white house on Corton cliff, W.N.W. From this buoy the Corton Sand, which is here about 1 $\frac{1}{4}$ mile wide, continues narrowing to a point, where it terminates at the N.W. Corton buoy, and forms the western boundary of St. Nicholas Gat.

MIDDLE CORTON BUOY (chequered black-and-white).—A *ridge* having grown up in a westerly direction between the west and S.W. buoys, a chequered buoy, marked

"Middle Corton," has been placed thereon, in $3\frac{1}{2}$ fathoms, with Lowestoff Church S.W. by W. $\frac{1}{2}$ W.; West Corton buoy N.E.; and the S.W. Corton buoy, south.

S.W. CORTON (chequered black-and-white) in 5 fathoms, lying S.S.W., $1\frac{1}{2}$ mile from the West Corton buoy, with Lowestoff high light W.S.W. $\frac{3}{4}$ W.; and Corton Church N.N.W. $\frac{1}{4}$ W. The buoy, marked "Holm Hook," before described.

S.E. HOLM (black) lies in $6\frac{1}{2}$ fathoms, with Lowestoff Church spire, in a line with the low lighthouse, N.W. by N.; Pakefield Church Tower, its length open south of Pakefield windmill, W. by N.; and the N.E. Holm buoy N.E.

MIDDLE HOLM (black), in 8 fathoms, with Lowestoff mill, in line with the northernmost house at Lowestoff, bearing N.W. by W. $\frac{1}{2}$ W.; Nelson's Monument, in line with the highest mill west of Yarmouth, N. $\frac{1}{4}$ W.; S.E. Holm buoy S.W. by W., westerly; and N.E. Holm buoy N.E. by N.

N.E. HOLM (black), in 8 fathoms, with Lowestoff mill, in line with the north part of Lowestoff battery, west; Gorleston north mill, in line with Yarmouth south pier-head, N. by W. $\frac{1}{2}$ W.; and S.E. Corton N. $\frac{3}{4}$ E.

S.E. CORTON (black), in 6 fathoms, with the chancel of Gorleston Church, in line with the pilot-house on south pier-head, N.N.W. $\frac{1}{4}$ W.; Lowestoff windmill, apparently midway between Lowestoff Church and a grove of trees, W. by S. $\frac{3}{4}$ S.; and N.E. Corton buoy N. $\frac{1}{2}$ W.

N.E. CORTON (black), in 5 fathoms, with Lowestoff high light S.W. by W.; and the S.E. Corton S. $\frac{1}{2}$ E., distant a mile.

CORTON SPIT (black), in 4 fathoms, with Corton Church W. by S. $\frac{1}{2}$ S.; and the N.E. Corton S. $\frac{1}{2}$ E., distant $\frac{2}{3}$ of a mile.

N.W. CORTON (black), in $2\frac{1}{2}$ fathoms, with Yarmouth Church, in a line with a high mill, (Harrison's) and the new bathing house north of the jetty, N. by W.; St. Nicholas light-vessel N. $\frac{1}{2}$ E.; Corton spit buoy S. $\frac{3}{4}$ E.; and South Scroby buoy E.S.E.

The chief passage into YARMOUTH ROADS, for ships of great draught of water, has always been between the Corton Sand, on the western side, and St. Nicholas Bank, or Kettle Bottom, on the eastern side, generally called St. Nicholas Gat. This channel is pointed out by three black buoys on the eastern edge of the Corton Sand, (before described,) and a red buoy and a light-vessel on the western edge of the St. Nicholas Bank. It is about $\frac{1}{3}$ of a mile wide, with a depth of from $5\frac{1}{2}$ to 6 fathoms at low water.

ST. NICHOLAS BANK, or KETTLE BOTTOM, is a *long narrow sand*, about $1\frac{1}{2}$ mile in length from south to north, having on it from $2\frac{1}{4}$ to 3 fathoms, and marked out by the following buoys and a light-vessel:—

Trinity House Notice, London, April 2nd, 1846.—In order to facilitate the navigation into and out of Yarmouth Roads, through the wide and deep-water channel between the Scroby and St. Nicholas, or Kettle Bottom Sand, commonly called Hewett's Channel, the St. Nicholas light-vessel has been moved to the position previously occupied by the red buoy, at the southern end of St. Nicholas (otherwise Kettle Bottom) Sand; and that the said red buoy has been placed about $\frac{1}{2}$ of a mile to the southward of the position from which the said light-vessel has been removed: also that the chequered buoy on the south end of the Scroby Sand has been replaced, in precisely the same spot, by a black beacon nun-buoy, of a large size.

ST. NICHOLAS LIGHT-VESSEL, as now placed, is moored in $4\frac{1}{2}$ fathoms, with the following marks and bearings, viz.:—Yarmouth New Church, in line with Victoria Terrace, N. by W. $\frac{3}{4}$ W.; the south part of the Grove, touching the north side of the fence of Nelson's Monument, N.W. $\frac{3}{4}$ N.; the second house north of Gorleston south mill, in line with the inner part of Gorleston south pier, N.W. by W. $\frac{1}{2}$ W.; South Scroby buoy S.E.; Scroby Fork buoy N.E. $\frac{1}{2}$ N.; North St. Nicholas buoy N. $\frac{3}{4}$ E.; and N.W. Corton buoy W. by S.

The RED BUOY, called the south buoy of St. Nicholas, as now placed, lies in $3\frac{1}{4}$ fathoms, with Yarmouth Old Church, in line with the outer part of Yarmouth Jetty, N. by W. $\frac{1}{2}$ W.; Gorleston south mill, in line with the inner part of Gorleston south pier, N.W. by W.; St. Nicholas light-vessel S.E.; North St. Nicholas buoy N.N.E.; and N.W. Corton buoy S. by W.

NORTH NICHOLAS (black), with staff and ball, has lately been removed, in a southerly direction, and now lies in $4\frac{1}{2}$ fathoms, with Yarmouth Old Church N.N.W. $\frac{1}{4}$ W.; Scroby Fork buoy S.E. by E. $\frac{3}{4}$ E.; and the S. W. Scroby buoy N.N.E. $\frac{3}{4}$ E.

It appears from a recent Admiralty Survey, made by Captain W. Hewett, R.N., that a new channel is now open between the St. Nicholas and Scroby Sands, $\frac{1}{2}$ a mile in width at its northern, and $\frac{3}{4}$ of a mile at its southern boundary, with from 6 to 9 fathoms, in a N. $\frac{1}{2}$ W. and S. $\frac{1}{2}$ E. bearing, which is marked out by the St. Nicholas light-vessel and north beacon-buoy on the port or larboard, or western side; and by three buoys of the Scroby on the starboard or eastern side. The former of these have been already described; and those on the Scroby lie with the following marks and bearings:—

SOUTH SCROBY (a black beacon nun-buoy) lies in $3\frac{1}{2}$ fathoms, with the chancel end of Lowestoff Church, in a line with the south part of the red-tiled farm buildings, (Mr. Taylor's) near Lowestoff, bearing S.W. $\frac{1}{2}$ W.; Southern mill at Old Town, on with the northern end of the Naval Hospital, N.W. $\frac{3}{4}$ N.; and the Scroby Fork buoy N. $\frac{1}{2}$ W.

SCROBY FORK (black-and-white striped), in $5\frac{1}{2}$ fathoms, with the southernmost mill at Gorleston, in one with the pilot-house on the pier-head bearing W. $\frac{1}{2}$ N.; Yarmouth Chapel, on with the jetty head, N.W. $\frac{3}{4}$ N.; and the Scroby S.W. buoy, N. by W., distant a mile.

S.W. SCROBY (chequered black-and-white), in 5 fathoms, with the chancel end of Yarmouth Old Church N.W. $\frac{1}{4}$ N.; Hemesby Church N. $\frac{3}{4}$ W.; and Gorleston Pier W.S.W.

SCROBY ELBOW BUOY, (chequered black-and-white).—The Scroby Elbow Sand having extended to the westward, between the S.W. and west buoys, a white buoy, marked "Scroby Elbow," was, in January, 1846, placed in $6\frac{1}{2}$ fathoms, with Lacon's Brewery chimney, on with the south end of the Silk Factory, bearing W. by N. $\frac{1}{2}$ N.; West Scroby buoy N. by E. $\frac{1}{4}$ E.; and S. W. Scroby buoy S. $\frac{1}{4}$ W.

DIRECTIONS FOR SAILING FROM ORFORDNESS TO YARMOUTH ROADS.

VESSELS proceeding from Orfordness towards Yarmouth, should bring Baudsey cliff well open of Orford beach, bearing W.S.W. $\frac{3}{4}$ W., until Aldborough Church bears N.N.W.; then steer directly N.E., 18 or 19 miles, or until the lighthouses of Lowestoff appear in a line, bearing N. by E.; this course will take them between Aldborough Knapes and the Ridge and Sizewell Bank. In turning to windward, you may stand in-shore to 9, 8, and 7 fathoms, and off to 12 or 14 fathoms, the soundings being regular; but do not bring the lower light of Orfordness to the westward of W. by S., lest you should run on the Knapes; observe also, not to bring the said lighthouse to the southward of S.W. $\frac{1}{2}$ W., or you may approach too near the Sizewell. The leading-mark taking you through between these shoals, is Orfordness lights in one, bearing S.W. by W. $\frac{1}{4}$ W. By night, to avoid the Ridge, you must not bring the high light to the southward of W. by S. $\frac{1}{4}$ S., until you have passed it nearly 4 miles, for the shoalest part of the bank lies nearly E.N.E., $3\frac{1}{2}$ miles from the high light. These precautions will also be necessary when bound to the southward, for by keeping the lights in one, after passing the Sizewell, will take you within the Ridge; to avoid which, the high light should be opened to the southward of the low light in time. Blythborough Lodge open to the northward of Dunwich Church, clears the north end of the Sizewell.

ALDBOROUGH BAY lies between the Ridge and Sizewell. A sandy flat runs off the shore; but there is good anchorage with off-shore winds, in 7, 8, or 9 fathoms, Orfordness lower light bearing S.W. $\frac{1}{2}$ W., and Aldborough Church N.W. by W. $\frac{3}{4}$ W.

SOUTHWOLD, or SOLE BAY, lies between the Sizewell and the Barnard. The anchorage there is good, with off-shore winds, in 8 and 9 fathoms, within $\frac{1}{2}$ a mile of the shore; but, in approaching the Barnard, you must not get into less than 9 fathoms water, for its edges are steep, and there are 8 fathoms close to its eastern side. There is now a red buoy placed on the S.W. edge of the Barnard.

If intending to pass through Lowestoff Inner Channel, when you are off the south end of the Barnard, in 7 fathoms water, and Southwold Church is at least twice its apparent breadth open to the left of the houses at Easton, which is the mark for clear-

ing the south end of the Barnard, continue with that mark on, until Pakefield light-house bears N.W.; steer towards it in that direction, passing over the *flat* between the Barnard and Newcome Sands, with 3 to $3\frac{1}{2}$ fathoms at low water, until Covehithe Church is in a line with the extreme of Kessingland fish-houses. Keeping this mark on will lead through the Lowestoff South Road, between the Newcome, and the Lowestoff Inner Shoal. Pakefield mill and barn in one, bearing N.N.W. $\frac{1}{2}$ W., will also lead in, and clear the south end of the Newcome, in 16 feet at low water, until the above mark comes on. At night bring Pakefield light N.W., and keep it so until Lowestoff low light bears N.E. by N., then proceed in that direction until the Stanford light-vessel bears about E.N.E. or E. by N.; steer towards it, and having passed it to the westward, continue in a N.N.E. direction to Lowestoff North Road, and to Yarmouth Roads; or, by keeping within 2 cables' length of the beach, when passing the lower light, you may pass, within the inner shoal, in 16 to 17 feet at low water. Vessels working in between the Barnard and the Newcome, must tack immediately on losing sight of the Pakefield light.

THE STANFORD CHANNEL is now become again navigable and buoyed out, as described in page 20. The mark for running in between the buoys that mark the southern entrance, is to bring the Stanford light-vessel N. by E. $\frac{1}{2}$ E., and run in with the mark on, until abreast of the Holm Hpok buoy, when you may steer N.N.E. for Lowestoff and Yarmouth Roads.

ST. NICHOLAS GAT.—Vessels proceeding from Orfordness to Yarmouth Roads by the Gat, or Channel between the Corton and St. Nicholas Sands, having, by the foregoing directions, cleared the Ridge, and other dangers about Orfordness, and advanced, with the Orford lighthouses in one, 6 or 7 miles, will then be abreast of the Sizewell Bank, and may pursue a N.E. course for about 7 leagues, which will carry them to the entrance of the Gat.

The best leading-marks into or out of the Gat are, Yarmouth Church over the end of the jetty, bearing nearly N. by W., or Yarmouth Chapel on with a white mill near the jetty; or Gorleston Church N.W. $\frac{1}{2}$ N., is a good mark.

The channel between the N.W. buoy of the Corton Sand and the St. Nicholas light-vessel, is about $\frac{1}{4}$ of a mile in width, the least depth mid-channel is $5\frac{1}{2}$ fathoms at low water; the soundings are very regular: and having passed through the Gat, you suddenly get into 9 and 10 fathoms, which depths gradually lessen as you advance towards the pier.

The anchorage in Yarmouth Roads is extensive, and there is room for any number of ships; the ground is *sandy*, and ships, sometimes in heavy gales from the N.N.E. and S.S.W., are apt to bring home their anchors.

TIDES.—It is high water at Yarmouth Roads, on the full and change of the moon, at 40 minutes after 8, and the spring-tides 6 feet, but the flood-stream continues to run to the southward till half after 10. At Lowestoff it is high water on the shore at 9 o'clock; the tides rise $7\frac{1}{2}$ feet, and the flood-stream runs till half after 10. At Orfordness it flows on the shore until 40 minutes after 10, and the flood continues till 11; spring-tides rise 11, neaps $8\frac{1}{2}$ feet.

FROM YARMOUTH AND ORFORDNESS TO THE DOWNS.

Description of the Sand Banks, &c.

IN this outer track are some *dangerous shoals*, namely:—the *Inner* and *Outer Gabbards*, the *Galloper*, the *Four Mile Knolls*, the *Falls*, the *Long Sand*, and *Kentish Knock*; the two latter may be considered connected with the sands that so greatly impede the entrance to the Thames, but the others are separated, and lie at a considerable distance from them.

THE INNER GABBARD is a *shoal*, about $6\frac{1}{4}$ miles in length, lying N.E. $\frac{1}{2}$ N. and S.W. $\frac{1}{2}$ S., having on its shallowest part 2 fathoms at low water. This is about the extent of 2 miles in the central part of the shoal, but on the other parts are from

4 to 10 fathoms. Upon the central part a black buoy is placed, with Orfordness high light N.N.W. $\frac{1}{2}$ W., distant about 15 miles; the South buoy of the Shipwash W.N.W. $\frac{3}{4}$ W., 12 miles; the Sunk light-vessel W. $\frac{1}{2}$ S., about 18 miles; and the Galloper light-vessel S. by W. $\frac{3}{4}$ W., 11 miles. On the other parts are from 3 to 9 fathoms. It is steep-to, and at $\frac{1}{2}$ a mile distance on each side, there are from 13 to 16 fathoms.

The OUTER GABBARD.—About 4 miles to the eastward of the Inner is the Outer Gabbard, a *narrow shoal*, of about $3\frac{1}{2}$ miles in length, but divided into two parts by a narrow swashway. This shoal lies N.N.E. and S.S.W., and has from 9 to 3 fathoms on it; the north end bearing S.E. $\frac{1}{2}$ E., distant $18\frac{1}{2}$ miles from Orfordness high lighthouse. A buoy, striped red-and-white, is placed on this shoal, in the least water, at about a mile from its N.N.E. end, with Orfordness lighthouses bearing N.W., distant $18\frac{1}{2}$ miles; the South buoy of the Shipwash W. $\frac{3}{4}$ N., 18 miles; the Sunk light-vessel W. $\frac{1}{2}$ S., $24\frac{1}{2}$ miles; and the Galloper light-vessel S.W. $\frac{1}{2}$ S., nearly 14 miles. This shoal is also steep-to: and there are from 15 to 17 fathoms within $\frac{1}{2}$ a mile of it all around. The buoys of the Inner and Outer Gabbards bear from each other east and west, distant 6 miles.

There is a constant rippling of the tide over both these shoals, excepting at slack water, by which their situation may be readily known, should the weather be so hazy as to prevent the buoys from being seen. Between the Inner Gabbard and the Galloper, there are from 13 to 15 fathoms water.

The GALLOPER is a very *dangerous shoal*, having, on some places, not more than 8 feet at low water. It extends 5 miles N.E. and S.W., from 7 fathoms at each end, and is not a mile across at the broadest part, which is near the middle. This part lies S. by E. $\frac{1}{2}$ E. from the high light at Orfordness, distant 23 miles; E.S.E. $\frac{1}{2}$ E., from the buoy on the Long Sand Head, distant 13 miles; E. by N., 13 miles from the Kentish Knock light-vessel; and N.E. by E. $\frac{1}{2}$ E., 31 miles from the North Foreland lighthouse. The shallow part of this sand extends full 4 miles, having only $1\frac{1}{2}$, 2, 3, or in some spots, 4 fathoms. The sea commonly ripples over it. Near the south-west end a light-vessel is moored, in 15 fathoms, on which are exhibited two lights, placed horizontally, on two separate masts, elevated 32 feet above the level of the sea. This vessel bears about S.W. by W. $\frac{1}{4}$ W., 2 miles from the above-mentioned shoalest part of the sand, and lies in latitude $51^{\circ} 45'$ north, and longitude $1^{\circ} 55\frac{1}{2}'$ east. About $\frac{3}{4}$ of a mile to the south-eastward of the light-vessel lies a black buoy, which will point out the usual position of the vessel, should it be removed by any accident. The light-vessel bears from Orfordness high light S. $\frac{3}{4}$ E., 24 miles; the North Foreland lighthouse N.E. by E. $\frac{1}{2}$ E., $28\frac{1}{2}$ miles; and from the Long Sand Head E.S.E. $\frac{1}{2}$ S., 12 miles.

The tide here flows, full and change, till $\frac{3}{4}$ after 11, running nearly 3 knots. The flood commences from the N.E., then E.N.E. The channel between the Galloper and the Long Sand Head is about 12 miles wide, and has from 20 to 17 fathoms in it, shoaling gradually as you approach the Long Sand Head. On the east side of the Galloper are 12, 16, 18, and 20 fathoms; at 3 miles distance are 27 fathoms, coarse sand, with small black stones; near to the south end are 14 fathoms, the ground stony; about $\frac{3}{4}$ of a mile outside the north end are 14 fathoms, with coarse stones; and close to this end are 9, 8, and 7 fathoms.

On the Admiralty chart of the Thames, a *new shoal* is laid down, extending S.W. $\frac{1}{2}$ S., 5 miles, from 9 fathoms at each end, on which are some *patches*, with only 4 and $4\frac{1}{2}$ fathoms. The northern one lies S.S.W., about $3\frac{1}{2}$ miles from the buoy of the Galloper. S.W. by S. from this spot is another, with similar depth, about $\frac{3}{4}$ of a mile distant. The soundings at about $\frac{1}{2}$ a mile from the east side are from 19 to 14 fathoms, and on the west side rather more. The distance between the north end of the shoal and the south end of the Galloper is above 2 miles, with 16 to 20 fathoms.

These *shoals* are called, in Captain Hewett's survey, the *Four Mile Knolls*, and are situated on and connected with the North Falls, and continue in a S.W. $\frac{3}{4}$ S. direction, having on it 7, 9, and 10 fathoms, to the latitude of $51^{\circ} 35'$, where it deepens to 13, 14, 12, and 17 fathoms, and turns in a S.W. by W. direction, to the latitude of $51^{\circ} 28'$, where commences what may be termed the South Falls: these stretch down to the latitude $51^{\circ} 13'$, and are scarcely more than a mile across in any part, the shoalest water being $4\frac{1}{2}$ and 5 fathoms, and this in the latitude from $51^{\circ} 22'$ to $51^{\circ} 17'$, about $6\frac{1}{2}$ miles to the eastward of the Goodwin light-vessel, and between which there are from the Falls, 24, 28, 30, then 13, 12, and 10 fathoms to the light-vessel.

The LONG SAND extends to the northward so far as $51^{\circ} 45\frac{1}{2}'$ north, where it terminates in a point about $\frac{3}{4}$ of a mile broad, having $4\frac{1}{2}$ fathoms near it; this point, called the Long Sand Head, bears from the Galloper light-vessel N.W. by W. $\frac{1}{2}$ W., distant 12 miles; from the Gunfleet beacon S.E. by E. $\frac{1}{2}$ E., 10 miles; and from the south buoy of the Shipwash S. by W. $\frac{1}{2}$ W., distant 8 miles. Close to the eastward of the sand head are 5 and 6 fathoms, deepening suddenly to 8 and 9 fathoms. A black buoy is placed at this sand head, and lies in 6 fathoms at low water, with the Sunk light-vessel bearing N.W. $\frac{1}{2}$ W., distant 5 miles; the Kentish Knock light-vessel S. $\frac{1}{2}$ W.; and the Naze Tower N.W. $\frac{1}{2}$ N., just touching the S.W. side of Walton Hall. The Naze Tower bearing N.W., will lead clear through Goldner's Gat, and past the Long Sand Head, in 9 and 10 fathoms.

The KENTISH KNOCK is a *dangerous* and *extensive shoal*, lying in nearly a S.W. and N.E. direction, its length being 7 miles, and its broadest or middle part 2 miles; its N.E. end bears from the Galloper light-vessel W. $\frac{1}{2}$ N., distant 12 miles, and from the Long Sand Head buoy S. by W., distant $4\frac{1}{2}$ miles; its S.W. end bears from the Galloper light-vessel W. by S., distant 16 miles, and from the North Foreland lighthouse N.E. $\frac{1}{2}$ N., almost 14 miles. A considerable part of this sand dries at low water, and the whole of it is shallow, with from 3 to 6 feet, though in some places there are 2 and 3 fathoms.

KENTISH KNOCK LIGHT-VESSEL.—This vessel is moored on the east side of the sand, a short distance to the eastward of the situation in which the beacon-buoy formerly laid. The light on board this vessel is exhibited from a single lantern; it revolves, and burns at an elevation of 38 feet above the level of the sea. This vessel is furnished, like the other vessels of the Corporation of Trinity House, with a ball at the mast-head; but, in addition thereto, it is surmounted by a second ball, of smaller size, whereby she may be with certainty distinguished, under all circumstances, during the day-time.

This light-vessel bears from the Galloper light-vessel W. $\frac{1}{2}$ S., 11 miles; from the North Foreland lighthouse N.E. $\frac{1}{2}$ E., 19 miles; and from the Sunk light-vessel S.S.E., 10 miles. There is also a watch-buoy laid about $\frac{1}{2}$ a mile to the westward of the above light-vessel. This watch-buoy is black, with its head half white, and the words "Kentish Knock" painted upon it. Close to the south-eastern side of the sand, which is steep-to, are 5, 6, 8, and 9 fathoms, the ground generally soft and muddy; very near its northern extremity are 10 and 11 fathoms; and between it and the Long Sand, 8, 9, 10, and 12 fathoms. There is a passage between it and the Long Sand, $2\frac{1}{2}$ miles wide; but no vessel must attempt to run through without the greatest necessity.

The GOODWIN LIGHT-VESSEL exhibits three bright lights, on separate masts, at 35 and 23 feet above the level of the sea; it lies N.E., nearly 2 miles from the nearest part of the North Sand Head that dries at low water, in 10 fathoms, with the North Foreland lighthouse N.W. by N., $6\frac{1}{2}$ miles; Ramsgate Pier lighthouse N.W. by W. $\frac{1}{2}$ W., $6\frac{1}{2}$ miles; and the South Foreland high light S.W. by W. $\frac{1}{2}$ W., $13\frac{1}{2}$ miles.

In order to distinguish these lights from the two Foreland lights, they are exhibited in such a manner, that the middle light appears considerably higher than the two extreme lights, forming an erect triangle; so that they can never be mistaken; and in foggy or hazy weather, a gong is constantly struck on board of her, to warn ships that they are near the North Sand Head. The situation of this light-vessel renders it impossible for vessels to get upon the North Sand Head, or any part of the Goodwin, if proper attention be paid to the three following short and clear directions, viz.:—

1st.—The grand intention of the Goodwin lights being to keep vessels to the eastward of the Goodwin; the masters of all ships and vessels, in coming from the North Sea towards the Strait of Dover, must be careful not to bring the Goodwin lights to bear more southerly than S.S.W., by compass; but, on the contrary, should always keep the lights rather to the westward than to the southward or eastward of that bearing, while they are to the northward of them, and they will be sure then to pass far enough to the eastward of every part of the Goodwin, by steering a S. by W. course after they have passed the lights.

2dly.—The masters of all vessels coming from the Strait of Dover towards the North Sea, must be careful not to shape a northerly course until the Goodwin lights bear N. by E. by compass; but, on the contrary, they should always keep the lights rather to the northward of that bearing than to the eastward of it, while they are to

[NORTH SEA.]

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the southward of them, and they will then be sure to pass far enough to the eastward of every part of the Goodwin.

3dly.—Should any vessel coming from the North Sea towards Dover Strait, be prevented by wind or tide, or otherwise, from proceeding to the southward, at the back of the Goodwin, or to the eastward thereof, the master can, by a single bearing of the Goodwin lights, anchor under the North Sand Head, in 6 or 7 fathoms, clean ground, and ride there as safely as the light-vessel does: in order to do which, he should keep to the northward of the light-vessel; and when that bears nearly south, anchor about $1\frac{1}{2}$ mile from it. Or, should he prefer getting in to the westward of the Goodwin, so as to have the Gull Stream open, he may run in to the northward of the Goodwin, upon a N.W. course, until he judges he has run $2\frac{1}{2}$ or 3 miles within, or to the N.W. of the lights, and then anchor, in 7 or 8 fathoms, the lights bearing from you S.E.

BEACON on the GOODWIN SANDS.—*Trinity House, London, July 11th, 1844.*—This Corporation has caused a standing beacon to be placed upon the eastern edge of the Goodwin Sands, on a spot which dries at low water, spring-tides; and at which the under-mentioned objects bear by compass as follows, viz.:—North Foreland lighthouse N. by W.; South Foreland high lighthouse W. by S. $\frac{1}{2}$ S.; North Sand Head light-vessel N.N.E. $\frac{1}{2}$ E.; and Gull Stream light-vessel N.W. $\frac{1}{2}$ N.

Mariners are requested to observe, that this beacon is surmounted by a ball, which is elevated 51 feet above the level of the sand. They will also observe, that at the distance of 18 feet below the centre of the ball, there is a refuge gallery, easily accessible in case of need, and by which the beacon is rendered at all times readily distinguishable from the masts and balls of either of the floating light-vessels in the vicinity of the Goodwin Sands.

SAFETY BEACON.—**GOODWIN SANDS.**—This beacon is placed on the south-eastern part of the Goodwin Sands, with the object of affording means of safety to persons who may unfortunately suffer shipwreck upon parts of these dangerous shoals, from which this beacon is accessible at low water; and mariners are hereby cautioned, that, being situate a considerable distance within the south-eastern edge of the sand, this beacon is not on any account to be regarded as a beacon of direction; and they will observe, from it the South Sand Head light-vessel bears S.W. by W., westerly, distant about $6\frac{1}{2}$ miles; the South Foreland upper lighthouse W.S.W. $\frac{1}{2}$ W.; the Gull light-vessel N.W. $\frac{3}{4}$ N., northerly, distant about $3\frac{1}{2}$ miles; and the Goodwin light-vessel N.E. by N., distant about $5\frac{1}{2}$ miles.—*Trinity House, London, 21st October, 1840.*

DIRECTIONS FOR SAILING FROM YARMOUTH TO ORFORDNESS, AND THENCE TO THE DOWNS, &c.

VESSELS proceeding from Yarmouth Roads for Orfordness, must run out through St. Nicholas Gat, with the marks as before directed; and when they have passed to the southward of all the buoys, steer S.W., 7 or 8 leagues, which course will take them between the Sizewell and Knapes, until they bring Orford lights in one, taking care, when abreast of Orfordness, to clear the Ridge and Nathaniel's Knoll, until they get Baudsey cliff well open of Orfordness beach, coming no nearer to the Ridge than 9 or 8 fathoms (see page 22) which latter mark will take them into Hollesley Bay. But if directly bound for the Downs, bring the high light to bear west, distant 3 miles, and a S. by W. $\frac{1}{2}$ W. course, for 25 miles, will carry you abreast of the N.E. point of the Kentish Knock; then steer S.W., 21 or 22 miles, and you will be at the entrance of the Gull Stream.

From Hollesley Bay to the Downs.—Vessels sailing from Hollesley Bay for the Downs, with an easterly wind, commonly turn down towards Orfordness with the ebb-tide; and having passed the eastern buoy of the Whiting, turn south-easterly. Bring the high light N. by W., which mark will lead clear to the northward of the Shipwash; and when they have passed the light-vessel off the North Ship Head, about $1\frac{1}{2}$ mile, they will fall into the tract just mentioned, and may steer S. by W. $\frac{1}{2}$ W., 25 miles, which will lead to the eastward of the Kentish Knock, &c.

In sailing near the Shipwash, be careful to make proper allowance for the tide: and with contrary winds you may stand toward the Shipwash into 12 or 14 fathoms, and off into 17 or 18 fathoms; towards the Long Sand Head into 9 or 10 fathoms, and off into 20 fathoms; towards the Knock into 12 or 13 fathoms, and off into 16 or 18 fathoms; and when you are in a line between the Kentish Knock light-vessel and the Galloper light-vessel, which bear E. $\frac{1}{2}$ N. and W. $\frac{1}{2}$ S. from each other, steer directly S.W. for the Gull Stream: the leading mark through which is, the South Foreland upper light on with the middle of Old Stairs Bay.

TIDES.—It is high water at the Long Sand Head, at the full and change of the moon, at $\frac{1}{4}$ an hour after 11; springs rising 15 feet, neaps about 10. At the North Foreland at 11h. 15m.; springs rising 10 feet, and neaps 7. The flood sets over the Shipwash W.S.W., and the ebb E.N.E., so that vessels passing from the Gunfleet to the Long Sand Head, must have it nearly on their beam; during the two first hours of the flood it sets W. by S. between the Long Sand Head and the Kentish Knock, and also between the Long Sand and the Sunk, with great velocity; while the ebb runs equally rapid in the contrary direction.

FROM YARMOUTH ROADS TO FLAMBOROUGH HEAD AND SCARBOROUGH.

Description of the Land.

THE land about Orfordness is generally low; but it becomes somewhat more elevated as you proceed to the northward; the coasts of Suffolk and Norfolk are low, but Foulness and the adjacent land is a perpendicular cliff, which, at Mundesley, is 50 and 60 feet high; from thence it is level, with few exceptions: near Hunstanton it is clifly, and rises 80 feet; and Flamborough Head is a remarkable and magnificent cliff of white stone, with a lighthouse on its summit.

YARMOUTH TO FOULNESS.

Description of the Shoals, Buoy, &c.

SANDS.—The road before Yarmouth is encompassed by various sands, which occasionally shift, and alter their dimensions. Besides those already described, two branches run off to the northward of St. Nicholas Bank, having deep-water between them; the outer or eastern bank forms the Cross Sand and Newarp, and the inner or western shoal is the Scroby. There is also a *narrow bank*, which runs off to the north-eastward of the Scroby, called the *Sea Heads*. To the westward of the Scroby and Sea Heads is the *Barber*, and farther north the *Cockle Bank*. There is a channel between the Scroby and the Sea Heads on one side, and the Cross Sand and Newarp on the other, but it is not buoyed, so that the passage from the northward, commonly used, to and from Yarmouth Roads, is between the Scroby and Sea Heads on one side, and the Barber and Cockle on the other. This passage is commonly called the *COCKLE GAT*.

THE CROSS SAND lies about $1\frac{1}{2}$ mile to the eastward of the Scroby, and is 6 miles in length, from 4 fathoms at each end, and the breadth under 4 fathoms does not exceed $\frac{1}{4}$ of a mile in its broadest part. About $\frac{1}{4}$ a mile northward of the buoy on its south end, is a *narrow ridge*, running N.N.E. and S.S.W., $\frac{3}{4}$ of a mile. At $1\frac{1}{4}$ mile N.N.E. from the latter shoal, another *shoal patch* commences, and runs in the same direction $1\frac{1}{2}$ mile farther, having from 6 to 12 feet on it. Near the shoalest part of this, the Middle Cross Sand buoy is placed; on the other parts there are generally from 3 to $4\frac{1}{2}$ fathoms at low water. Three black buoys are now placed on the eastern edge of this sand, with the following marks and bearings:—

CROSS SAND SOUTH BUOY (black) lies in $4\frac{3}{4}$ fathoms, with Yarmouth Church, just touching the northern part of the town battery, bearing N.W. $\frac{1}{2}$ W.; the southernmost mill at Gorleston, in a line with the pilots' house on the pier, W. $\frac{1}{2}$ N.; and Lowestoff Church S.W. by W.

CROSS SAND MIDDLE BUOY (black) lies in 6 fathoms, with a conspicuous chimney, (Lt. Garnam's) in a line with Nelson's Pillar, bearing W. by S.; Hemesby Church, apparently touching the southernmost of two windmills at that place, N.W. $\frac{1}{2}$ N.; Lowestoff Church S.W. $\frac{1}{2}$ W.; and the Newarp light-vessel N.N.E. $\frac{1}{2}$ E.

NORTH CROSS SAND BUOY.—This additional black buoy has lately been placed on the N.E. extremity of the Cross Sand, and nearly in a line with the two black buoys previously on that sand, and about $2\frac{1}{2}$ miles from the northernmost, or Middle Cross Sand buoy; it lies in 5 fathoms, with Winterton lighthouse in one with the Cockle light-vessel; Yarmouth Old Church W. by S. $\frac{1}{2}$ S.; Middle Cross Sand buoy S.W. by S.; and Newarp light-vessel N.N.E.

The NEWARP is another *dangerous bank*, the flat of which commences at the North Cross Sand buoy, and runs nearly N.N.E., $4\frac{1}{2}$ miles, to the light-vessel. You may cross this flat in 7 to 9 fathoms, with Winterton Church W.N.W., or the Cockle light, west. The *Newarp* is a *round shoal*, of $2\frac{1}{2}$ and $3\frac{1}{2}$ fathoms, of small dimensions, and on the flat, which runs about a mile to the northward of it, is a red buoy, and to the north-eastward of the buoy a light-vessel.

NEWARP BUOY (red) lies in 5 fathoms.—By a Trinity House notice, dated February 10th, 1845, this buoy has been removed $\frac{1}{2}$ a mile farther northward, and now lies in 6 fathoms, with Newarp light-vessel N. $\frac{1}{2}$ E., $\frac{3}{4}$ of a mile.

NEWARP LIGHT-VESSEL exhibits three bright fixed lights, upon separate masts, elevated 37 and 22 feet above the water, and visible 9 miles off. During the day this vessel will be easily distinguished, by carrying three balls—one at each mast-head. It is moored in 18 fathoms, and lies N. $\frac{1}{2}$ E., $\frac{3}{4}$ of a mile from the Newarp buoy, with Martham Church steeple, twice its own breadth open to the southward of Winterton Church steeple, bearing W. by N.; Hasborough lower lighthouse just open to the northward of the high light; Hasborough Church steeple N.W. $\frac{1}{4}$ W.; and Yarmouth Church steeple S.W. by W. $\frac{1}{4}$ S.

The SCROBY lies to the northward of St. Nicholas Bank, or Kettle Bottom, being separated from it by the new channel, described in page 21; and is divided into the North and South Scroby by a swashway, with from $4\frac{1}{2}$ to 5 fathoms in it. Its length from north to south is 7 miles, and is $1\frac{1}{2}$ mile at its broadest part. Many parts of this sand are nearly dry at low water, having only 2 or 3 feet over them, and on the edge 3 and $3\frac{1}{2}$ fathoms, with 5 or 6 fathoms close to the sand.

On the western edge of the Scroby are seven buoys; the four southernmost of which have been described in page 22; the west, middle, and north buoys lie with the following marks and bearings, viz.:—

WEST SCROBY (chequered black-and-white) lies in $7\frac{1}{2}$ fathoms, with Hemesby Church Tower N. by W. $\frac{1}{4}$ W.; the northernmost mill at Gorleston, in a line with Yarmouth jetty-head, S.W. by W.; and the S.W. Scroby buoy S. by W., distant $2\frac{1}{2}$ miles.

MIDDLE SCROBY (chequered black-and-white) lies in $5\frac{1}{2}$ fathoms at low water, with the following marks and bearings, viz.:—Yarmouth Church spire S.W. by W. $\frac{1}{4}$ W.; West Scroby buoy S.W. by S.; North Scroby buoy N.N.E. $\frac{1}{2}$ E.; S.W. Cockle buoy, north; and Inner Barber buoy N.W. $\frac{1}{4}$ W., 8-10ths of a mile.

NORTH SCROBY (chequered black-and-white), with staff and ball, lies in 4 fathoms at low water, with Winterton lighthouse, midway between the church and house on Winterton cliff, N.N.W. $\frac{3}{4}$ W.; Cockle spit buoy N. $\frac{1}{2}$ W.; Middle Scroby S.S.W. $\frac{1}{2}$ W.; and S.W. Cockle N.W. by W. $\frac{3}{4}$ W.

The SEA HEADS form a *narrow sand*, about 3 miles in length, with 4 or 5 fathoms at its ends, but near the middle only $1\frac{1}{2}$ fathom. The beacon-buoy formerly stationed at the Sea Heads, has been taken away, and discontinued.

COCKLE LIGHT-VESSEL.—Trinity House, London, December 15th, 1843.—A floating light-vessel has been moored on the eastern side of the Cockle Gat, at the northern entrance into Yarmouth Roads, and mariners are to observe, that a bright revolving light will be exhibited on board the same, on the evening of the 20th inst., and thenceforth continued from sun-set to sun-rise.

By a Trinity House notice, dated the 10th of April, 1845, the light-vessel in the Cockle Gatway has been moved $\frac{1}{2}$ a mile S.W. by W. $\frac{1}{2}$ W. from her former position, and now lies in 8 fathoms at low water, spring-tides, with the following marks and

compass bearings, viz.:—Winterton Church Tower, in line with the north side of Winterton lighthouse, N.W.; Gorleston Church Tower, in line with the middle of the new houses south of Yarmouth jetty, S.W. $\frac{1}{2}$ S.; Newarp light-vessel N.E. by E. $\frac{1}{2}$ E.; Cockle fairway buoy N.N.W. $\frac{1}{2}$ W.; Cockle spit buoy N.W. by W.; Outer Barber buoy S.W. by W.; and North Scroby buoy S. by W. $\frac{1}{2}$ W.

Mariners are to observe, that the change in the position of the Cockle light-vessel, will not occasion any alteration in the courses in approaching her, either from the northward or the southward.

Great caution should, at all times, be observed in approaching and navigating this Gatway. Vessels coming up at night, should steer S. by E. $\frac{1}{2}$ E. towards the Cockle light, and never bring her to the northward of a N.E. $\frac{1}{2}$ N. bearing, in running from her towards Yarmouth Roads; and with a flood-tide keep close to the Cockle and Barber. The placing of the Cockle light-vessel, by the Corporation of the Trinity House, has rendered this intricate navigation comparatively safe, and this great thoroughfare for shipping has been made available by night as well as by day.

The BARBER and COCKLE SANDS lie on the west side of the passage called the Cockle Gat; and the Scroby Sand, on which are placed two white and one red beacon-buoy, forms the eastern side. The channel between is, at present, $\frac{3}{4}$ of a mile wide. On the Barber and Cockle are five buoys, (hereafter described,) which are to be left on the port or larboard, or western side. A mile N. by W. $\frac{1}{2}$ W. from the N.E. Cockle, lies the black fairway buoy, in 7 fathoms, with Winterton Church N.W., nearly.

SOUTH INNER BARBER BUOY (black) lies in 5 fathoms, on the S.E. edge of the sand, at about $\frac{1}{2}$ a mile N.E. of its S.W. end, with Winterton lighthouse N. by W., and the Outer Barber buoy N.E. by N., 6-10ths of a mile.

The BUOY of the OUTER BARBER (black) lies in 5 fathoms, with Yarmouth New Church Tower, midway between the second and third mill from the northward, bearing S.W. $\frac{3}{4}$ S.; Ormsby mill, apparently touching the northern side of a cottage, N.W. by W. $\frac{1}{2}$ W.; Winterton light tower N. by W. $\frac{3}{4}$ W.; and the North Scroby buoy E. by N., distant a mile. The channel between the Inner Barber and Cockle Sands has filled, so that the depth of water therein at low water, is reduced to 7 feet. The north Inner Barber buoy (red) has been taken away.

The COCKLE runs out to the northward of the Barber 2 miles, and, in fact, is a continuation of it; its southern part has about 9 feet on it; but to the northward it narrows, and deepens to 3 and 4 fathoms. On the eastern edge of the Cockle are the three following black buoys:—

S.W. BUOY of the COCKLE (black) lies on the eastern edge of the bank, in 6 fathoms, with the North Scroby buoy bearing S.E. by E. $\frac{1}{2}$ E., $\frac{3}{4}$ of a mile; Caistor Church W.S.W. $\frac{1}{2}$ S.; and Winterton lighthouse N.W. by N. $\frac{1}{2}$ N.

COCKLE N.E. SPIT BUOY (black) lies in 4 fathoms, with the S.W. Cockle buoy S.W. $\frac{3}{4}$ S., $\frac{3}{4}$ of a mile; Winterton Church and lighthouse in one, N.W. $\frac{1}{4}$ N.; and Hemesby Church N.W. by W. $\frac{3}{4}$ W.

N.E. BUOY of the COCKLE (black) lies in 5 fathoms, with the N.E. spit buoy S.S.E., nearly a mile; and Winterton Church, open to the northward of the lighthouse, bearing N.W. $\frac{1}{2}$ W.

Within the Cockle Sand is a channel, called **Hemesby Hole, or Gat**, $\frac{3}{4}$ miles in length, and $\frac{1}{2}$ a mile broad; the entrance to which is a swashway, lying between the south end of the Inner Barber and the main, having $2\frac{1}{4}$ fathoms in it at low water; but within and without it are 5 fathoms, deepening to the northward to 8 or 10 fathoms. The course through Hemesby Hole is N. $\frac{3}{4}$ E., at about $\frac{1}{2}$ a mile from the shore, between the *Hood*, which is a *long narrow shelf*, extending parallel to the shore as far as Winterton lighthouse to the westward, and the western edge of the Cockle Sand to the eastward. This channel, now called Nelson's Gat, is frequently used in preference to the Cockle Gat, by small coasters, in day-light.

According to a Trinity House notice, dated 14th November, 1838, a white buoy has been placed on the western spit of the Cockle Sand, in 3 fathoms, with the high chimney of the silk factory at Yarmouth, on with the Beachman's look-out at Caistor, bearing S.S.W. $\frac{1}{2}$ W.; Hemesby Church tower, just open to the southward of two houses, with bright red-tiles, on Hemesby cliff, N.W. by N.; and Outer Barber buoy S.E. $\frac{1}{2}$ E.

In proceeding from Yarmouth Roads through Nelson's Gat, keep the cupola of the old chapel at Yarmouth a little open to the southward of the small factory chimney, until Caistor Church comes open of the highest part or mound of Caistor cliff, in about 4 fathoms; then bring and keep the two look-out houses at Winterton in a line, steering down about N. by E., and passing the white buoy on the starboard side, until you deepen your water to 7, 8, or 9 fathoms. By keeping the red-tiled boat-house on Caistor cliff, open to the eastward of the cliff to the northward, you will avoid the Hood, which has only 6 feet water on the south part of it.

Off Winterton Ness is a *narrow shelf*, with 4 to 9 feet over it, $1\frac{1}{2}$ mile in length, extending S. by E. $\frac{1}{2}$ E. and N. by W. $\frac{1}{2}$ W., its outer edge being nearly $\frac{1}{2}$ a mile from the shore.

HASBOROUGH GAT is situated between the Newarp and Sea Heads, which lie to the south-westward, and Winterton Ridge, Hammond's Knoll, and Hasborough Sand, to the north-eastward; it is about 7 miles wide, and in depth from 10 to 20 fathoms. The Newarp buoy and light-vessel will be on the west or port or larboard side, and the black buoy on the Hasborough Sand on the east or starboard side, going to the northward.

The Newarp light-vessel has been described in page 28.

HASBOROUGH SAND stretches from a black buoy at its south end, to a buoy, quartered black-and-white, at the north end, in a N.N.W. direction more than 10 miles, and is, generally speaking, about a mile broad, from 4 fathoms on one side to 4 fathoms on the other, at its widest part, being in some places nearly dry at low water spring-tides. This sand is steep-to on both sides, having from 5 to 7 or 8 fathoms close to its edges, and at $\frac{1}{2}$ of a mile distance from 13 to 15 and 16 fathoms water, which renders the lead of essential utility to ships standing in-from sea. Near the south end, on the eastern side, it is somewhat shallower and irregular; and N. by E. from the south black buoy, is a *narrow ridge* growing up, and extending $3\frac{1}{2}$ miles, over which are 4 $\frac{1}{2}$, 6, and 8 fathoms.

HASBOROUGH SAND SOUTH BUOY is black, and lies in 7 fathoms water, directly at the southern extremity of the sand; with the Newarp light-vessel bearing S. by W. $\frac{1}{2}$ W., distant $6\frac{1}{2}$ miles; the N.E. buoy of the Cockle S.W., 9 miles; Winterton lighthouse S.W. by W. $\frac{1}{2}$ W., 9 $\frac{1}{2}$ miles; Hasborough high lighthouse W. by N. $\frac{3}{4}$ N., 11 miles; and Cromer lighthouse N.W. $\frac{1}{2}$ W., 19 $\frac{1}{2}$ miles.

HASBOROUGH SAND NORTH BUOY, quartered black-and-white, has, according to a Trinity House notice, dated 8th October, 1839, been moved about $\frac{1}{2}$ a mile to the N.E. of its former position, and now lies in 5 fathoms, with Cromer lighthouse bearing W. by N., distant $12\frac{1}{2}$ miles; and Hasborough high lighthouse S.W. $\frac{1}{2}$ W., 10 miles. Between this buoy and the shoal part of the sand, which bears from it about S. by E., distant a mile, there are 5, 4, and 3 fathoms.

HASBOROUGH LIGHT-VESSEL is moored off the northern extremity of the Hasborough Sand, exhibiting two lanterns, with fixed lights, raised on separate masts, 37 feet high. On the sides of the vessel the words "Hasbro' Light" is painted. This vessel is moored in 13 $\frac{1}{2}$ fathoms, with Cromer lighthouse W. by N.; Hasborough high lighthouse S.W. $\frac{1}{2}$ S.; and the northern buoy of Hasborough Sand E. by S., distant a mile. The lights may be seen 3 leagues off.

HAMMOND'S KNOLL is a *narrow ridge*, running nearly in a similar direction to the Hasborough Sand. S.E. by E. $\frac{1}{2}$ E., 4 miles from the black or south buoy on Hasborough Sand, is the southern extremity of this sand, in 6 fathoms; it thence extends N. by W. $\frac{1}{2}$ W., $6\frac{1}{2}$ miles, where there is a depth of 7 $\frac{1}{2}$ fathoms; both ends then gradually sink to seaward, and lose themselves in the deep water. On the shallowest part, which is about $2\frac{1}{2}$ miles in length, are from 3 to $3\frac{1}{2}$ fathoms; the eastern edge is very steep-to, having from 8 to 10 and 12 fathoms close to it. Between the southern end and the black buoy of Hasborough Sand, are from 9 to 16 fathoms.

The WINTERTON RIDGE is a *shoal* lying to the south-eastward of Hammond's Knoll; it is about 4 miles long, and $\frac{1}{2}$ of a mile broad, in a N. $\frac{1}{2}$ W. and S. $\frac{1}{2}$ E. direction, with only 2 fathoms over its shallowest part. At its north end are 6 fathoms, and towards its south extremity 5 fathoms. Its south end bears S.E. $\frac{1}{2}$ S.; distant nearly 8 miles from the black buoy of Hasborough Sand, and east, 7 miles, from the Newarp light-vessel. This shoal is steep-to, especially on the eastern side. Between the north

end of the Ridge and the south end of Hammond's Knoll, which are distant nearly 2 miles, the depths are from 9 to 15 fathoms.

SMITH'S KNOLL.—The middle of this bank, on which are only $3\frac{1}{4}$ fathoms, lies nearly E.N.E. $\frac{1}{2}$ E. from Yarmouth Church, distant about 8 leagues; its northern end N.E. by E.; and its southern end E. $\frac{1}{4}$ S. from the same. The extent of the bank is 19 miles in length, and $\frac{3}{4}$ of a mile in breadth. It is steep-to on the eastern side. From the depth of 4 fathoms, $\frac{3}{4}$ of a mile to the eastward, are 27 fathoms; and $\frac{3}{4}$ of a mile farther 25 fathoms, coarse brown sand, with black speckled stones. The general soundings between Smith's Knoll and the Ridge, are from 15 to 20 fathoms, of fine brown-reddish sand, with blue clay. From the before-mentioned soundings of $3\frac{1}{4}$ fathoms on Smith's Knoll, Yarmouth Church bears W.S.W. $\frac{1}{2}$ W., distant 8 leagues; the light-vessel at the north end of the Newarp W. $\frac{3}{4}$ S., 17 miles; and Winterton light W. $\frac{1}{4}$ S., 22 miles. Between Smith's Knoll and Winterton Ridge, is what the fishermen call the Middle Ground. The water there is deep, and the bottom fine light brown sand and clay.

The tides at the south end of this knoll run $2\frac{1}{2}$ miles with spring, and a mile at neap. Towards the north part of the shoal they set almost north and south. At the south end and middle N.N.E. and S.S.W., the latter part of the flood drawing round to the westward; but the ebb to the eastward. Both are much governed by the prevailing winds; a westerly wind often retards the run of the flood to the westward, while it accelerates the ebb to the east, and on easterly winds the contrary.

About S.W., 5 miles from the northern end of Smith's Knoll, there is said to be a *shoal*, of from 3 to 6 fathoms, and between that and the Ridge, another, of similar depth; but the water all about them is from 16 to 20 fathoms. There are also other *banks* to the northward, called the *Lemay* and *Ower*, &c., which we shall describe more fully hereafter.

DIRECTIONS FOR SAILING FROM YARMOUTH ROADS, THROUGH THE COCKLE GAT, &c.

The **COCKLE GAT** is that passage which is bounded on the western side by the Barber and Cockle Sands, (already described,) and on the eastern side by the Scroby and Sea Heads.

In proceeding from Yarmouth Roads through the Cackle Gat, bring Nelson's Monument on with Yarmouth Jetty, and the barn near Gorleston bearing S.W. $\frac{1}{2}$ S.; or if ebb-tide, Yarmouth Church on with the North Star Battery: either of these marks will lead through the Cockle Gat. The course from the jetty will be N.E. $\frac{1}{4}$ N., distance 5 or 6 miles, making proper allowance for the tide, which is generally rapid.

In working through the Cockle Gat with a turning wind, come not too near the Scroby, for it is steep-to; but so soon as you lessen your water to 6 fathoms, tack, for the flood-tide sets strongly over the Scroby, and the ebb over the Cockle. After passing the buoys of the Scroby, you may stand towards the opposite side, into 5 or 6 fathoms; but you will recollect that those sands are steep-to. The passage between these sands is $\frac{3}{4}$ of a mile wide. When you have passed the Cockle light-vessel, you may proceed on a N. by W. course, until Winterton and Martham Churches come in a line; you will then be clear of danger, and may continue to the northward.

Vessels not having occasion to enter Yarmouth Roads, may, having rounded Orfordness, and passed the Knapes, as before directed, proceed N.E. $\frac{1}{2}$ N., until abreast of St. Nicholas Gat, then, changing their course to N.E. by N., until Winterton lighthouse comes to bear N.W., a N. $\frac{1}{2}$ E. course, 5 miles, will carry them on the outside of the sands, and up to the Newarp light-vessel; thus they will go to the eastward of all the sands lying in the vicinity of Yarmouth. Vessels returning during the night, should take their departure from the Newarp lights, steering S. $\frac{1}{2}$ W., until Winterton light bears N.W., then a S.W. by S. course will carry them clear of all Yarmouth Sands.

It is high water in Yarmouth Roads at 8h. 40 m. on full and change days: at the back of the sands at $\frac{1}{2}$ past 10; and at Orfordness at 10h. 40m.

DIRECTIONS FOR SAILING THROUGH HASBOROUGH GAT, &c.

COMING from seaward, and proceeding for Hasborough Gat, the first object to be attended to, by day or night, will be to make the light-vessel off the north end of the Newarp; when in sight of her, do not bring her to the eastward of north; or if you make her to the eastward of north, steer to the eastward till you bring her to bear north or N.W., before you come nearer than 3 or 4 miles of her; if, with an ebb-tide, she bears N.N.W., then you may safely steer for her, as the ebb sets nearly in that direction. Having passed the vessel, continue your course N.N.W., or more westerly, till you see the lights of Hasborough in one, they will then bear about N.W. of you; or in dark weather take soundings from the shore, in 12, 10, or 8 fathoms: and should you pass the light-vessel 1 or 2 miles to the eastward, the ebb will set you fairly through the Gateway.

Should you be bound to Yarmouth Roads, steer W. by N. from the Newarp light-vessel, or rather such a course as will keep the light-vessel E. by S. from you, allowing for the crossing of the tide, and you will sail to the northward of the broken grounds extending from the Sea Heads; you may then haul round into the Cockle Gat, by the Cockle light-vessel, leaving the buoys of the Scroby on your port or larboard hand, and the buoys of the Cockle and Barber on your starboard hand: you may then proceed for the roads, by the marks already given.

SAILING OUT OF HASBOROUGH GAT.—Being off Hasborough, and night approaching, a vessel may run out through the Hasborough Gat with the greatest safety, by bringing the two lights of Hasborough in one, bearing N.W.; thence steering to the S.E., and keeping them on, will lead above a mile to the north-eastward of the Newarp light-vessel. The eastern side of the Newarp bears S. by W. from the light-vessel; therefore, in rounding this light, and hauling to the southward, you must not bring her to the eastward of north, or N. by W., till you have passed the light 3 or 4 miles; when you may steer a S.S.W. $\frac{1}{2}$ W., or S.W. by S. course, which will take you outside the Cross and Holm Sands. In rounding the light-vessel, if you have a half-flood in your favour, and a commanding breeze, you may safely steer S.S.W.; for the flood setting to the S.S.E., will keep you clear of the Newarp; but be careful with an ebb-tide (which sets in a contrary direction) of hauling up too soon, as it will drift you towards the sands, and without a favourable breeze, you may be obliged to anchor.

Should the wind be from the E.N.E., it will be safer to borrow to windward of the lights in one. You may haul up as soon as the great light of Hasborough bears W.N.W. (for the south end of Hasborough Sand bears from that light E. S. E. $\frac{1}{2}$ E.); this will enable you to keep a better offing, in order to round the light-vessel, which is a safe guide for clearing the Newarp. Should the gale be heavy from the eastward, and you have not day-light sufficient to secure Yarmouth Roads, or the fetching to windward of the light-vessel is improbable, it is then recommended to anchor off Hasborough, with the lights about W. by S., a league from the shore, or nearly half-way towards the sand, in 10 or 12 fathoms, where the Gat is entirely open, rather than run off Winterton; for, in the former berth, you will find considerable shelter from Hasborough Sand, but in the latter you will be quite exposed.

Since the new light-vessel has been placed at the northern entrance of the Cockle Gat, a vessel may now proceed with safety towards Yarmouth Roads with an easterly wind, by attending to the directions given in page 29.

From Winterton Ness to Foul Ness the land runs about N.N.W., 17 miles, and nearly in the same direction stretches Hasborough Sand; near the north end of which is the light-vessel described in page 30. In coasting along the shore, the soundings are regular—5, 6, 7, and 8 fathoms; farther out are 10, 11, 12, and 14 fathoms; therefore, in turning to windward, you may stand towards the shore into what depth you please, and off to 14, 15, or 16 fathoms; but should you deepen your water to 20 or 23 fathoms, and then decrease to 18, be careful and put about, for when in that depth you will be close to Hasborough Sand. The channel between this sand and the shore is, in most parts, about 8 miles wide, and is called the Would.

In the fairway off Hasborough, a *bank* appears to be growing up, called, in some charts, the *Ridge*. It lies nearly W.S.W. and E.N.E., $1\frac{1}{4}$ mile long; it is not $\frac{1}{2}$ a mile

broad, and has 7 fathoms on it. The mark for the middle of this bank is, Hasborough high light S.W. $\frac{1}{4}$ S., distant $3\frac{1}{2}$ miles. The inner end of this bank of rippings, in 9 fathoms, lies $2\frac{1}{2}$ miles from the shore; and the outer end above $4\frac{1}{2}$ miles from Hasborough Sand. Near to it, within, are 10, 9, and 8 fathoms; and without, 10, 15, and 17 fathoms. E. $\frac{1}{4}$ S., $1\frac{1}{2}$ mile from Hasborough high light, lies a small *knoll*, with 4 fathoms on it. Ships, in passing this knoll, should not approach any nearer to the shore than 7 fathoms. As there are not less than 7 fathoms on the ridge, commanders of ships need not avoid it, unless the swell of the sea happens to be very high; nor need they, when in the fairway, be alarmed at their quickly coming from 12 to 15 fathoms into 6 or 5 fathoms. A *sandy flat* lines the shore all the way from Winterton to Foulness.

But as you approach Foulness, you should give the shore a berth, and not get into less water than 9 fathoms, the bottom being *rocky* and *foul* a mile out.

CROMER LIGHTHOUSE.—At Cromer, or Foulness, is a lighthouse, 38 feet in height; but the lantern is 274 feet above the level of high water. It exhibits a bright light, which revolves, and shows a flash every minute; and, in clear weather, may be seen more than 7 leagues off. From this light, the northern quartered-buoy of the Hasborough Sand bears E. by S. $\frac{1}{4}$ S., distant about $11\frac{1}{2}$ miles; and Hasborough light-vessel E. by S., $10\frac{1}{2}$ miles.

FOULNESS BUOY.—A buoy (coloured red) has been laid on the outer part of Foulness Spit, off Cromer, in 3 fathoms, with Hasborough high lighthouse, its apparent length open west of Hasborough Church, bearing S.S.E.; Cromer lighthouse W.S.W.; and Beeston Church tower, its length open east of Runton cliff, W.N.W.

TIDES.—In Yarmouth Roads it is high water at 8h. 40m., full and change, and spring-tides rise 8 feet, neaps 6. Outside the sands the flood runs until half-past 10; in the Cockle Gat the flood sets strongly over the Scroby, and the ebb over the Cockle and Barber; through Hasborough Gat the flood sets S.S.E., a little southerly, ending at half-past 10, while the ebb sets contrary. With strong springs, its velocity will be $3\frac{1}{2}$ miles an hour, one tide carrying a vessel 4 leagues, moderate springs full 3 leagues, and neaps about 2 leagues. Outside of Hasborough Sand it does not run with so much rapidity, the flood setting more southerly. On Hasborough Sand the water rises about 10 feet at springs. Off Hasborough it is high water at 7h. 40m., spring-tides rising 11, and neaps 7 feet; but the flood-stream continues running to the southward until 10h. 15m. Near Foulness it is high water at 7h., the flood-stream running until 10h. 15m., springs rising 14, and neaps $8\frac{1}{2}$ feet. Near Winterton Ridge it is high water at 7h. 50m., the flood-stream running southward till 10h. 30m.; spring-tides rise 10 feet, and neaps 6 feet.

SHOALS LYING TO THE EASTWARD AND NORTHWARD OF HASBOROUGH SAND, AND BETWEEN FOULNESS AND FLAMBOROUGH HEAD.

WE have already noticed two patches of shoal water, said to lie to the north-westward of Smith's Knoll, which, with others scattered about, renders the navigation of these parts, particularly between Yarmouth and Flamborough Head, extremely hazardous for ships of a heavy draught of water, except with neap-tides, or very mild weather. The shores of Norfolk, as already observed, are generally low, with the trifling exception of a part about Foulness, and another at Hunstanton cliffs.

Midway between Smith's Knoll and Hammond's Knoll, is a *bank of shoal water*, having on its southern part only 3 fathoms: this lies with Hasborough lights W. $\frac{3}{4}$ N., distant 20 miles; and Cromer light N.W. by W. $\frac{3}{4}$ W., 27 miles. From hence it runs in a N.W. $\frac{3}{4}$ N. direction, about 3 miles, deepening as it goes to the northward, to 4, 5, and 6 fathoms; you then suddenly drop into deep water.

The **LEMAN** and **OWER** are *two dangerous shoals*, which appear to have increased of late, and now have not more than 5 feet water over them in some places: [NORTH SEA.]

they lie nearly parallel to each other, the inner one, called the Leman, being about $7\frac{1}{2}$ leagues from the opposite coast. They were surveyed by Captain Hewett in 1826, who has given the following description of these dangers:—

“**The LEMAN** extends in an irregular form, about 15 miles, from N.N.W. $\frac{1}{4}$ W. to S.S.E. $\frac{1}{4}$ E. Its southern extreme, in 4 fathoms, is in latitude $53^{\circ} 2' 50''$ north, and longitude $2^{\circ} 7' 45''$ east. Its northern extreme, latitude $53^{\circ} 10' 10''$ north, and longitude $1^{\circ} 50' 0''$ east. There are two remarkable elbows formed in this bank, both convexing to the south-westward: the southern elbow is in latitude $53^{\circ} 5'$ north, and longitude $2^{\circ} 1' 30''$ east; the northern elbow in latitude $53^{\circ} 8' 0''$ north, and longitude $1^{\circ} 53' 45''$ east. The southern end is distinguished by its greater convexity; and the soundings of approach to it, from the westward, when in a less depth than 5 fathoms, are very irregular. The northern elbow is the shoalest part of the Leman, where a depth of 5 feet only, for a superficial extent of about a square $\frac{1}{4}$ of a mile, exists. Between these elbows, the prevailing depths are from 11 to 13 feet; and from each of them, to the corresponding extremes of the bank, the depth gradually increases to 4 fathoms, and thence to 6 and 7 fathoms.”

From the south end of the Leman, in $4\frac{1}{2}$ fathoms, Hasborough high light bears W. $\frac{1}{4}$ S., 25 miles; Hasborough light-vessel W. by N., westerly, 19 miles; and Cromer lighthouse W. by N., 30 miles. From its north end, Hasborough high light bears S.W. $\frac{1}{4}$ W., 23 $\frac{1}{2}$ miles; Hasborough light-vessel S.W. by W., 15 miles; and Cromer lighthouse W.S.W. $\frac{3}{4}$ W., 24 miles, nearly.

“A vessel coming near the Leman from the westward, may, by keeping the lead going, have warning of her approach towards it; but not so in coming from the eastward, for the bank on this side is so extremely steep-to, that she may strike the ground before soundings by the lead can be obtained, particularly with a flood-stream running. It is a very remarkable feature of this bank, that throughout its whole extent, the shoalest water is on its extreme eastern edge, so that, in crossing it from the westward, so soon as the shoalest water is obtained, the lead will immediately drop down into 18 and 20 fathoms near the southern end, into 13 and 14 fathoms between the elbows, and into 15 and 16 fathoms near the northern end; the steepest part of the bank being near the northern end, where 23 and 24 fathoms are to be found within 2 cables' length of it.

“When the stream of tide is running (ebb particularly), if the Leman does not show itself by breakers, occasioned by a sea running, it will be sure to do so by a smooth and rippling; and so remarkable is this effect, caused by an increased velocity of the stream of tide running over the shoal's eastern edge, that from the mast-head, in moderate weather, the bank is strongly marked out, so far as the eye can reach either way; and the elbows are so well delineated, that by the difference in their convexities, and the direction of the neighbouring smooth and rippling, they are readily distinguished from each other, and will serve as a most excellent departure.

“It is high water on the Leman, on full and change of the moon, at 6 o'clock; at which time the flood-stream runs in its full strength, 2 knots an hour, in a S. $\frac{1}{4}$ W. direction. This stream then gradually inclines to the westward, or with the motion of the sun, until full 8 hours' ebb, when it runs S.S.W. $\frac{1}{4}$ W., and its strength is diminished to $\frac{2}{3}$ of a knot an hour. It shortly after becomes slack, and so continues, until 5 hours' ebb, when the ebb-stream springs up N.N.W. $\frac{1}{4}$ W., veering round to the northward, and increasing in strength, until a little after low water, when it is found to run N. $\frac{1}{4}$ E. in its full force, at 2 knots an hour. It then inclines to the eastward, and diminishes in strength, until 4 hours' flood, when it is lost in the E.N.E.

“As a summary, with respect to the tide, it may be observed, that the flood-stream springs up S.S.E. $\frac{1}{4}$ E., and terminates S.S.W. $\frac{1}{4}$ W.; that the ebb-stream springs up N.N.W. $\frac{1}{4}$ W., and terminates E.N.E.; that it is high and low water when the respective streams are running in their full strength; and that it is slack water by the stream, between the third and fourth hours of the flood and ebb.

“It is also worthy of particular remark, that the stream of tide runs directly across the shoalest parts of the Leman, and at double the regular velocity; but it immediately resumes both the former direction and velocity.

“**The OWER** is by far more dangerous and irregularly formed than the Leman, and has its southern extreme (4 fathoms), in latitude $53^{\circ} 7' 30''$ north, and longitude

2° 6' 45" east; and its northern extreme, at the same depth, in latitude 53° 14' 0" north, and longitude 1° 53' 0" east. This bank has also two remarkable elbows, both lying in the same parallel of latitude, viz.—53° 10' 30" north; the eastern one being in longitude 2° 1' 0" east, the western one in 1° 57' 0" east; but, unlike those of the Leman, the eastern of these two convexes to the north-eastward, and the western to the S.W.; by which difference, and their relative bearings, they may readily be distinguished from those of the Leman, and also from each other; that is, when breakers, or the strength of the stream, cause the bank and these elbows to show themselves.

"From the southern end to the eastern elbow, the Ower, like the Leman, has its shoalest water on the extreme eastern edge, the prevailing depth being from 11 to 15 feet. This shoal ridge from thence runs across the bank to the western elbow, and there terminates in an extensive patch, of 5 feet depth, where it is very steep-to on the western side. To the northward of this patch the bank is more regularly formed; still, however, the eastern side throughout is the steepest, and most difficult to approach by the lead. In the middle of the bank, and $\frac{1}{2}$ a mile north of the above-mentioned patch, there is a hole, of $4\frac{1}{2}$ fathoms, with $2\frac{1}{2}$ fathoms on either side. At $\frac{1}{4}$ mile N. by W. $\frac{1}{2}$ W. from the above patch, there is a shoal part of some extent, with 11 feet only upon it, and which shows very conspicuously, by breakers, when the sea is running.

"That portion of the bank between the southern end and western elbow, shows itself by smooth and rippling, during the strength of the stream, in the same remarkable way that the Leman does; but, to the northward of this elbow, it is not so strongly marked, by reason of the more regular formation of the bank, and the stream of tide not setting so obliquely upon it.

"It is high water on the Ower, at full and change of the moon, at half-past 6 o'clock. The flood-stream runs in its full strength of 2 knots an hour, S. by W., at an hour after high water; then veers round towards the west, as at the Leman, and terminates in the S.W. by S., at $3\frac{1}{4}$ hours after high water. The ebb-stream commences at 5 hours' ebb in the N.W. by N., is in its full strength at 2 knots an hour, and running N. by W. $\frac{1}{2}$ W., at an hour after low water, and terminates in the east at 4 hours' flood. The flood-stream commences at 5 hours' flood, S. by E.

"A singular peculiarity in the tide about the Ower was observed:—there was no sensible rise in the tide until 3 hours after low water; and when the ebb-stream was nearly done, a sudden rise of 5 or 6 feet took place, so that nearly the whole rise of tide occurs in the last 3 hours of it. The stream of tide runs over the shoal ridge of the Ower, as at the Leman, with an increased velocity, equal to nearly double its natural strength.

"The southern extreme of the Ower bears from that of the Leman N. by E. $\frac{1}{2}$ E., and is distant $4\frac{1}{2}$ miles; the northern extreme of the Ower is from that of the Leman N.E. $\frac{1}{2}$ E., 4 miles; and the shoal patch of the Ower bears from that of the Leman (and which are the nearest parts of the banks) N.E. by E. $\frac{1}{2}$ E., 3 nautical miles."

From the north end of the Ower, Hasborough high lighthouse bears S.W. $\frac{1}{2}$ W., 28 miles; Hasborough light-vessel S.W. by W., 19 miles; and Cromer lighthouse W.S.W. $\frac{1}{2}$ W., 27 miles.

The LEMAN and OWER FLOATING LIGHT-VESSEL is moored between the sands, in 16 fathoms water, in latitude 53° 9' north, and longitude 2° 0' east, with the shoalest part of the Ower bearing N. by W. $\frac{1}{2}$ W., distant 2 miles; and the shoalest part of the Leman W. by N., distant about 4 miles. The lights are exhibited on two masts, the foremost of which revolves, and burns at an elevation of 38 feet above the water; whilst the aftermost is a fixed light, and burns at an elevation of 27 feet above the same level. Mariners are to observe, that the above are only placed as warning lights, to indicate the position of these dangerous shoals; and that the light-vessel is not to be approached in any direction, either by night or day.

By a Trinity House Notice, dated London, 20th February, 1840, mariners making this light-vessel during the day-time, are to observe, that in order to render her readily distinguishable from all other vessels in the North Sea, a ball is constantly hoisted on the mizen-mast, in addition to that upon the fore-mast. And, as a further precaution for preventing accidents, in cases in which vessels may be observed standing into danger, a gun will be fired on board the light-vessel; upon which signal, such measures

should be immediately taken by the persons in charge, as they shall deem best calculated to avoid the danger.

To the eastward of the Ower are three similar *ridges*, the least water over which is 5 fathoms. These all lie nearly parallel with each other, and are between the Leman and Wells Banks; while between them are channels, with deep water and good anchorage. On the western side, near the Leman, are 20 fathoms; between the Leman and Ower 19, 20, 21, and 22 fathoms; and a similar depth of water will be found between each of the other ridges, with generally good anchorage.

HADDOCK BANK.—About 5 leagues to the northward of the northern part of the Ower, and 12 leagues N.E. from Cromer lighthouse, lies the southern end of the *Haddock Bank*, and extends from thence 6 miles N.N.W. $\frac{1}{2}$ W., being nearly 2 miles wide, and having on its middle part 5 fathoms, increasing each way to 6 and 7 fathoms. Near it, on either side, are from 10 to 14 fathoms; and between it and the Ower, from 15 to 24 fathoms. N. $\frac{1}{2}$ W. from the northern end of the Haddock Bank, about 14 miles, and N.N.E. $\frac{1}{4}$ E., 50 miles from Cromer lighthouse, lies the *N.N.E. Hole*, a spot sinking suddenly to the depth of 40 fathoms; while between it and the Haddock Bank are from 13 to 17 fathoms.

CROMER OUTER BANK, or KNOLL, lies 9 miles N.N.W. $\frac{1}{2}$ W. from the northern part of the Leman, and $7\frac{1}{2}$ leagues N.E. $\frac{1}{4}$ E. from Cromer lighthouse, extending N.W. by W., about 2 miles, and is $\frac{3}{4}$ of a mile broad. Near its eastern end are $2\frac{1}{2}$ fathoms, and at its western end $3\frac{1}{2}$ fathoms. Between it and the Leman are 20 fathoms; the distance from the northern end of which, in 4 fathoms, is about 3 leagues.

CROMER INNER BANK lies 10 miles W.S.W. from the Outer Bank, 13 miles N. by W. from Hasborough light-vessel, and 13 miles N.E. from Cromer lighthouse, extending more than 3 miles N.W. by W. and S.E. by E. It is in breadth a mile, having on its middle 4 fathoms, and increasing at each end to 6 and 7 fathoms. Between this bank and the Knoll, or Outer Bank, are 17 and 18 fathoms; between the Inner Bank and Hasborough Sand there are 12, 18, to 14 fathoms; and between it and Foulness are 14, 15, 12, to 8 fathoms at low water.

SHERRINGHAM SHOAL.—This is a *narrow ridge of sand*, lying in a N.W. $\frac{1}{2}$ W. and S.E. $\frac{1}{4}$ E. direction, being about $4\frac{1}{2}$ miles in length, and having from 2 to $3\frac{1}{2}$ fathoms over its central part; but on its eastern part, to the distance of $\frac{1}{2}$ a mile, from 4 to 3 fathoms; and on its western part, to the distance of above a mile, from 5 to 7 fathoms. A black buoy is placed at its eastern end, in 4 fathoms, for which the marks are, Cromer lighthouse south, 7 miles; Blakeney Church W. $\frac{1}{4}$ S., 9 miles; and the village of Lower Sherringham S.W. by S. Two miles N.W. by W. from the buoy, are only 17 feet at low water, spring-tides. The body of this shoal is situated $5\frac{1}{2}$ miles from the shore; and between them is a good channel, with 8, 10, 9, 7, 6, and 5 fathoms water.

BLAKENEY OVERFALLS.—The eastern end of these overfalls lies about 4 miles W. by N. from the west end of Sherringham Shoal, with Kelling and Salthouse Churches in one, bearing S. $\frac{1}{2}$ E., having at their eastern end 4 fathoms; and thence extending N.W. by W. $\frac{1}{4}$ W., until they join the eastern part of the Burnham Flats: these, as well as Sherringham Shoal, lie in a direction nearly parallel to the shore. About $1\frac{1}{2}$ mile from their eastern end is a *patch*, of only 9 feet water. It then deepens again to 3 fathoms, for the space of a mile, where a *knoll*, commonly called the *Knock*, rises up, $\frac{1}{2}$ a mile in length, with only 9 feet water over it: the shoalest part lies directly N. by W. $\frac{1}{4}$ W., distant 7 miles from Blakeney Church, and about 4 miles from the shore. Three miles from hence to the westward, is another small *spot of shoal water*, with only 10 or 11 feet over it, being the westernmost of what may be called Blakeney Overfalls. Here they are joined by the Burnham Flats. Close to the outer edge of these overfalls are 5, 6, 7, and 8 fathoms; farther out are 10 fathoms; and within them are 6, 7, and 8 fathoms (coarse sand with black specks), gradually decreasing towards the shore. Between Blakeney and Sherringham Overfalls are 7 and 8 fathoms.

POLLARD.—About 8 miles N.W. $\frac{1}{4}$ N. from Cromer lighthouse, and between the N.W. end of Sherringham Shoal and the shore, is the *Pollard*, a small *patch*, with 3 and $2\frac{1}{2}$ fathoms over it: all round it are 5, 6, and 7 fathoms. Its inner edge is $1\frac{1}{2}$ mile off the shore, having a good channel on either side.

STUKEY OVERFALLS lie within Blakeney Overfalls, and extend along shore, from opposite Warnham Creek to beyond the fairway buoy of Wells Harbour. They form a narrow strip, of $2\frac{1}{2}$ and $2\frac{1}{2}$ fathoms, while within them are $4\frac{1}{2}$ and 5 fathoms; and between them and the Blakeney Overfalls, are not less than 6, 7, 8, and 9 fathoms. The western part of these is sometimes called the Wells Overfalls, and form part of the flat that extends to the Brid, or Bright Girdle.

The DUDGEON.—A light-vessel lies 24 miles N. by W. from Cromer lighthouse, carrying one light in the night-time, and riding a little to the westward of the Dudgeon Shoal, in latitude $53^{\circ} 15'$ north, and longitude $0^{\circ} 56'$ east. A gong is struck during fogs. This shoal lies N.N.W. $\frac{1}{2}$ W. and S.S.E. $\frac{1}{2}$ E., being nearly 3 miles in length, and a mile in breadth. There are 9 and 10 feet on the shoalest part, which is N.E., about a mile from where the vessel is stationed. On the other parts of the shoal are from 3 to $3\frac{1}{2}$ and 4 fathoms. To the southward the depth increases; and at the extremity of the shoal are 6 fathoms. From the Dudgeon light-vessel to Flamborough Head, the course is N. by W., and the distance $21\frac{1}{2}$ leagues.

The NORTH RIDGES commence $\frac{3}{4}$ of a mile N.W. of the north end of the Dudgeon, from which is a channel, with 5 and $5\frac{1}{2}$ fathoms in it. These are three narrow *ridges*, lying north and south of each other, and run in a N.W. and S.E. direction. They are 2 miles in length, with only 3, $3\frac{1}{2}$, and 4 fathoms on them at low water, with deeper water in the channels between them. With the light-vessel bearing S. by E. $\frac{1}{2}$ E., distant 4 miles, you will have only 3 fathoms water on the north side of these ridges; and with this bearing you will pass over them all in their shoalest parts. As these shoals lie very much in the way of ships of a heavy draught of water, the Dudgeon light-vessel should not be brought to the southward of S.E. by S., when you are between the distances of 2 and $4\frac{1}{2}$ miles from it. You will have 10 fathoms water at a mile to the westward of the shoals, which gradually shoal to $4\frac{1}{2}$ fathoms as you approach near to them. There are several other *patches*, about 3 miles north-westward of the North Ridges, with $3\frac{1}{2}$ to 5 fathoms on them. Large ships should, when near low water, pass to the eastward of the Dudgeon Shoal.

RACE'S or SOUTH-WEST BANK, lies to the west and S.W. of the Dudgeon, about 5 miles, Blakeney Church bearing from its south end S. $\frac{1}{2}$ W.; Cromer light S.S.E.; and Holkam Church nearly S.W. $\frac{1}{2}$ S.

This shoal is narrow, and is at present about $2\frac{1}{2}$ leagues long, lying in the direction of north, for 3 miles, from the S.E. buoy; it then runs N.W. $\frac{1}{2}$ N., for nearly 6 miles, to the N.W. buoy, shallowing to $1\frac{1}{2}$, 2, $2\frac{1}{2}$, and 3 fathoms at the southernmost end. Between it and the Dudgeon are 6, 8, 10, and 11 fathoms, except two narrow *patches*, which lie W. by N. $\frac{1}{2}$ N., nearly 4 miles from the Dudgeon light-vessel, and nearly a mile from the Race's Bank. These patches are nearly a mile in length, and run E.S.E. and W.N.W., and have only from $3\frac{1}{2}$ to 4 fathoms on them. Two buoys have been placed on this shoal, namely:—on its N.W. end, a red buoy, in 7 fathoms at low water, the light-vessel at the Dudgeon bearing therefrom E.S.E., distant about 7 miles; and on its S.E. end, a white buoy, in 5 fathoms at low water, the Dudgeon light-vessel bearing therefrom N.N.E. $\frac{1}{4}$ E., distant about 6 miles; and Blakeney Church S. by W.

The OUTER DOWSING'S south end lies 21 miles N. by E. $\frac{3}{4}$ E. from Foulness, and its shoalest part, near the south end, extends 3 miles N.N.E. and S.S.W., with from 5 to 7 fathoms on it. This part of the bank is about $\frac{1}{2}$ a mile broad. There is a small *patch*, with only $4\frac{1}{2}$ fathoms on it, which lies in latitude $53^{\circ} 17' 30''$, and longitude $1^{\circ} 16'$ east. A *bank*, of 8 and 9 fathoms, about a mile in breadth, runs to the northward, having 14 fathoms on its western side, and 11 and 12 on its eastern; and connects the southern with the dangerous shoals on the northern end of the Outer Dowsing.

The INNER DOWSING'S northern end lies 37 miles N.N.W. $\frac{1}{2}$ W. from Foulness; $14\frac{1}{2}$ miles N.W. $\frac{1}{2}$ W. from the Dudgeon light-vessel; 22 miles S. by E. $\frac{1}{2}$ E. from the Spurn; and 10 miles E.S.E. $\frac{1}{2}$ S. from Trusthorpe Church. It thence extends 6 miles S. by W. $\frac{1}{2}$ W., and is about $\frac{1}{2}$ a mile broad. The least water on this sand is 4 feet; close to the sand, on the west side, are 8 to 10 fathoms; and near the east side are 8 fathoms. The south end lies 9 miles E. by S. from Ingoldsmel Church; between which are 10, 9, 8, 6, and 4 fathoms. Between the Inner Dowsing and the Dudgeon light-vessel, are 9, 12, 10, 14, 10, and 7 fathoms. A black buoy, having a staff and ball, has been placed on the N.E. end of this sand, in $3\frac{1}{2}$ fathoms at low water.

INNER DOWSING OVERFALLS lie about a mile N.W. by W. from the black beacon-buoy on the north end of the Inner Dowsing. They consist of 4 or 5 small patches, and are about $\frac{1}{2}$ of a mile in extent each way. These patches are dangerous, as they have only 12 feet on them in some parts, with 6, 7, and 8 fathoms all round them, and that depth close to. Trustrhorpe Church bears from their centre N.W. by W. $\frac{1}{2}$ W., 9 miles. In the channel, between these patches and the Inner Dowsing, are 8 and 9 fathoms.

A shoal also lies about $\frac{1}{2}$ of a mile to the eastward of the south end of the Inner Dowsing, with only from 3 to $3\frac{1}{2}$ fathoms upon it. It runs N.N.E. and S.S.W., $1\frac{1}{2}$ mile, and is about $\frac{1}{2}$ of a mile broad. From its south end, in 3 fathoms, Addlethorpe Church bears W.N.W., $9\frac{1}{2}$ miles; and the chequered buoy, on the north end of the Docking, E. by N., $3\frac{1}{2}$ miles. Its north end bears from the same buoy W.N.W., 3 miles, nearly. This shoal lies very much in the way of heavy-laden ships passing between the Docking Sand and the Inner Dowsing. A ship bound to the southward by this channel, should pass within a mile to the westward of the Docking chequered buoy, in 12 or 13 fathoms. From thence a S.W. by W. course, 15 miles (allowing for the tide), will take you between the Burnham Ridge and Lynn Knock, to the light-vessel in Lynn Well.

The DOCKING SAND.—The north end of this sand lies E. by S. $\frac{1}{2}$ S., $3\frac{1}{2}$ miles from the south end of the Inner Dowsing; and west, 2 miles, from the red buoy on the north end of the Race's Shoal, and has a chequered black-and-white buoy upon its northern extremity. This buoy now lies in 9 fathoms, with Hunstanton lighthouse S.W., 18 miles; and Ingoldsmel Church W. by N., 13 miles. The south-western point of this sand lies about $\frac{1}{2}$ of a mile from the north point of Burnham Flats; between which is a swashway, of 5 or 6 fathoms. Near the northern part of the sand are only 7 or 8 feet water. The southern part of the Docking Shoal is an extensive triangular flat, having upon it from $1\frac{1}{2}$ to $3\frac{1}{2}$ fathoms, except a patch near its S.W. point, which nearly dries at low water. This spot lies N.E. by E., $1\frac{1}{2}$ mile from the red beacon-buoy on Burnham Flats. From the chequered buoy at the north end of the Docking, the shoal extends S.W., 5 miles. This side of the shoal is very dangerous, as the lead gives you no warning; for you will have 9 to 11 fathoms close to the bank. The S.W. side of the shoal runs S.E. $\frac{1}{2}$ E. and N.W. $\frac{1}{2}$ W., nearly 6 miles; and its N.E. side runs nearly N. by W. $\frac{1}{2}$ W., 7 miles, to the chequered buoy near the north point. The two latter sides of the shoal are not so dangerous to approach as the former. The channel between the Race's Bank and the Docking is only about 2 miles wide at the north end, near the buoys; but as you go to the southward, it is full 3 miles wide.

BURNHAM FLATS.—On the north extremity of these flats, lies a red buoy, with a staff and ball, in 4 fathoms, with Lynn Well light-vessel bearing W.S.W. $\frac{1}{2}$ W., distant $10\frac{1}{2}$ miles; Hunstanton lighthouse S.W. $\frac{1}{2}$ W., 12 miles; Brancaster high mill S.S.W. $\frac{1}{2}$ W., distant $11\frac{1}{2}$ miles; and Holkham Church S. $\frac{1}{2}$ E., $12\frac{1}{2}$ miles. The shallowest, and at the same time nearest, part of the Docking Shoal bears from the buoy N.E. by E. to E.S.E. $\frac{1}{2}$ E., distant $1\frac{1}{2}$ mile, this being the extreme breadth of the above swashway, or channel, the navigation of which it is the object of this buoy to facilitate. In this channel it is high water, full and change, at 6 o'clock; and spring-tides rise 16 feet.

By a Trinity House notice, dated 26th November, 1839, a black buoy, marked "Burnham Ridge," has been placed on the north end of that shoal, in 5 fathoms, with Ingoldsmel Church, a sail's breadth open to the northward of Addlethorpe Church, bearing N.W.; Holkham Church S. by E.; Lynn Well light-vessel W.S.W.; Hunstanton lighthouse S.W. $\frac{1}{2}$ S.; and Burnham Flats buoy east, distant about 2 miles.

Formerly, Addlethorpe and Ingoldsmel, or the Sister Churches in one, was the leading-mark to go to the southward of the shoalest part of the Docking; whereas, that direction will now inevitably run a vessel upon the northern end of Burnham Flats. Addlethorpe Church, about thrice its apparent breadth to the northward of Ingoldsmel Church, leads directly to the beacon-buoy. Between the north end of the Docking Sand and the south end of the Inner Dowsing, is a good deep-water channel, full 2 miles wide, with from 10 to 14 fathoms in it. In going through this channel, keep within $1\frac{1}{2}$ mile of the chequered buoy, to avoid the 3-fathom bank, before described.

These are the outer dangers and shoals which lie at any considerable distance from the land; others, lying near the shore, will be noticed hereafter, in our directions for sailing to the Humber, &c.

DIRECTIONS FOR SAILING FROM FOULNESS TO THE HUMBER.

THE shores from Foulness towards the Humber are, in many parts, *foul* and *rocky*, particularly off Cromer, Sherringham, and Weybourne; which places must therefore be attended to, and have, in coasting along, a good berth given to them. Being a league off Foulness, in 9 or 10 fathoms, fine grey sand with black specks, Cromer Church bearing S.S.W., your course toward Blakeney and Clay Harbour, will be about W.N.W. This will carry you between the Pollard and the shore; while a N.W. by W. course will take you on the outside of the Pollard, and between it and the Overfalls. In the former route you will have 6 and 7 fathoms; but in the latter, between the Pollard and the Overfalls, you will find 8, 9, and 10 fathoms.

BLAKENEY HARBOUR is considered the best on this coast, and forms a good retreat for vessels, during a heavy gale, blowing toward the shore. Its church may, in clear weather, be seen so far as the Dudgeon light, from which it bears S. by W. $\frac{1}{2}$ W., distant nearly $5\frac{1}{2}$ leagues. In running in from the westward for Blakeney Harbour, endeavour to bring the church to bear from you S.E. by S.; and run on in that direction, until you perceive the buoys. Salthouse and Kelling Churches in one, bearing S. $\frac{1}{2}$ E., will carry you just clear to the eastward of the Blakeney Knock and Overfalls. Langham white mills, which are to the westward of Blakeney, is a good mark for the harbour: you should bring them about S. $\frac{1}{2}$ W. A small *Millock* also may be seen, full 3 leagues off: this lies about $\frac{1}{2}$ a mile to the southward of the harbour: by keeping the Church open to the N.W. of it, $\frac{1}{2}$ a cable's length, you will be carried to the outer buoy. It is a bar harbour, and buoyed; but as the sands frequently shift their positions, it must naturally be hazardous to strangers; yet, in a gale of wind, it will be always more prudent to run for it, than hazard being driven on shore.

This harbour was surveyed by Mr. S. Watson, of Blakeney; and the following are that gentleman's observations:—

"It flows until 6 o'clock, full and change, at Blakeney; but outside of the harbour it runs to the southward 3 hours longer—a circumstance particularly to be attended to. You will not have less than 18 feet on the bar, in spring-tides. If it blows strong at N.W., or the wind any way to the northward, you will have more. With the wind to the westward, keep well westerly, the tide of flood setting strong easterly, till you are within the second or third buoy. This is the only harbour of safety for shipping, when caught in a gale of wind dead on the coast, and is capable of receiving ships of 400 or 500 tons. A flag is hoisted on the Church tower, as a signal when you may run for it, if the boats cannot get off: there will then be full 9 feet over the bar.

"There are overfalls off Blakeney, between 3 and 4 miles of the shore, with not more than 10 feet on some parts of them; therefore, ships of a great draught of water should not come within them till the flood-tide makes."

Since the above was written, signals have been erected, to facilitate the entrance of vessels into this harbour; these are as follow:—When one ball is placed upon the pole at the point, there are 8 feet water for a vessel coming in by the buoy, or West Channel. When two balls are shown, there are 10 feet; and three balls denote there are 12 feet. The same signals, with a flag over them, show the depth of water over the East Low, which is not buoyed out. Ship-masters are particularly requested to attend to the pilots waving on the point.

To the westward of Blakeney, between it and Wells, is a *shallow*, about a mile broad, stretching along the shore, with from 2 to 3 fathoms on it. Farther out are Stukey Overfalls, having from 13 feet to 3 fathoms on them at low water: the east end of these lie N.N.E. from Stukey Church, and have been already described. Between them and the shallow just mentioned, are 4 and 5 fathoms; and between them and Blakeney Overfalls, 7, 8, and 9 fathoms.

WELLS HARBOUR.—This place having recently been much improved, now forms another place of safety, in gales of on-shore winds. Its entrance is $5\frac{1}{2}$ miles N.W. by W. from that of Blakeney, where lies the fairway buoy, painted red. Within this, seven black buoys mark out the starboard side of the channel, and three white buoys

the port or larboard side. There are two large beacons, which being brought in one, bearing S. by W., lead to the outer buoy. You must proceed thence from buoy to buoy, until you reach the fourth black one; then two inner beacons will appear in a line, bearing S. by W. $\frac{3}{4}$ W. These, at night, have lights placed on them; and will lead above the buoys as far as the first, or Scalp beacon, which is erected on the edge of the sand, about $\frac{1}{4}$ of a mile beyond the last black buoy. You will now be directed upwards by two smaller beacons, which, when in one, bear S. $\frac{1}{4}$ E., until two others come on, bearing S.E.: these lead up into the harbour, to a sunk beacon, which you are to leave to the starboard. To the N.E. of this is good anchorage for small vessels, on a soft oozy bottom. Should the sands hereafter shift, these beacons will be removed accordingly, and kept so as to form the proper leading-marks.

Wells Harbour is nearly dry at low water; but spring-tides rise 16 and 18 feet. It is high water on the bar at 6h. 20m., at full and change; but the tide runs to the eastward for 3 hours longer: be, therefore, very particular in attending to the tides. About 2 miles off the mouth of the harbour, are some overfalls, of 2 and $2\frac{1}{2}$ fathoms; but between them and the buoys, are 4 and 5 fathoms.

IN WELLS ROAD, OR HOLKHAM BAY, vessels may find anchorage, in 3 fathoms, bringing Wells Church to bear S. by E.; Holkham Church S.W. $\frac{3}{4}$ S.; and the north part of the Scald Heads W.N.W., distant $1\frac{1}{2}$ mile from the shore. The Scald Heads are a range of small sand-hills, somewhat remarkable. To the northward also of this anchorage, about $\frac{1}{2}$ a mile, is good riding, in 4 or 5 fathoms, the ground holding well.

THE BRID, or BRIGHT GIRDLE, is a *dangerous bank*, of irregular formation, lying upon the flat which runs along from Wells Harbour, and off the Scald Heads. Part of this bank becomes dry at low water, and is above a mile off the nearest land. The centre, or dry part of it, bears from the outer buoy of Wells Harbour N.W. by W., distant 3 miles; and from the north tail of the Scald Heads E. $\frac{1}{4}$ S., $2\frac{1}{4}$ miles. A *flat of shallow water* extends to the northward of this part, which dries full $1\frac{1}{4}$ mile. On the outer side of this, about 3 miles from the shore, is a narrow channel, of $4\frac{1}{2}$, 5, and $5\frac{1}{2}$ fathoms, leading into Brancaster Roads. None but coasters well acquainted with this navigation, ought to attempt this passage; for on the north side of the Roads is a narrow bar, with only 8 and 9 feet water on it; therefore, the tide must be well flowed before you attempt to go to the westward of the Brid Girdle. There is also a passage within the Brid Girdle for small vessels; but this has only from 12 to 6 feet at low water, and requires considerable care. To go clear of the eastern point of the Brid Girdle, you must keep Holkham Church in one with the Obelisk, bearing S. $\frac{1}{4}$ W. To go to the westward, bring Burnham Deepdale Church over the Scald Heads, bearing S.S.W., which leads over the flat, in 7 or 8 feet at low water, into Brancaster Roads, where there are from $2\frac{1}{2}$ to 3 and 4 fathoms.

THE BURNHAM FLATS are to the north-westward, forming an extensive *shoal*, of a triangular form, and joining another to the westward, called the Woolpack. These two sands cover a space, from east to west, of full 9 miles, and from north to south of 7 miles; the whole of which is shallow water, having in some places only 1, 3, 6, 9, and 10 feet. At its northern end is the red beacon-buoy, and the black buoy on the Burnham Ridge (already described). Its western edge is steep-to, and forms the southern boundary of the entrance to Lynn Deep.

THE WOOLPACK is situated at the S.W. extremity of the Burnham Flats, and is very dangerous, being wholly composed of shallow water, and having many dry *patches* upon it. The S.W. point of the Woolpack, in 2 fathoms water, bears from the extremity of the Gore Point nearly N.N.E., distant 4 miles; and from Hunstanton lighthouse N.E. by N., $5\frac{1}{4}$ miles. There is a narrow swashway to the southward of the Woolpack and Burnham Flats, of $2\frac{1}{2}$ and 3 fathoms; but this channel is, to strangers, impracticable.

THE MIDDLE.—To the south-westward of the Woolpack is the *Middle Bank*, separated from the Woolpack only by the narrow channel above-mentioned. From thence it extends in a W.S.W. direction, for 3 miles, where it joins the Sunk. The extent of the part that dries is $1\frac{1}{2}$ mile long, and above $\frac{1}{2}$ a mile wide; it is divided into two parts.

THE SUNK is a narrow *sand*, stretching from the west side of the Middle, in a W. by S. direction, for $2\frac{1}{2}$ miles, to where it joins the Ferrer. The dry part is $1\frac{1}{4}$ mile

long. The *sandy flat* which surrounds the Sunk, continues full a mile to the westward of the dry parts of the Sunk, a red buoy being placed on its western extremity, from which the Hunstanton lighthouse bears S.E. $\frac{3}{4}$ S., distant $2\frac{1}{2}$ miles. There is a *swash-way* for small craft between the Middle and Sunk, with only 3 feet in it at low water: the leading-mark through it is, Hunstanton lighthouse on with Snettisham steeple, or Thornham Church on with Gore Point, bearing S.S.E. $\frac{3}{4}$ E. This channel is about $\frac{1}{2}$ of a mile wide.

The **FERRER SAND** runs in a S.W. by S. direction, and joins the dry sands which encumber the entrance to Lynn. On its eastern edge is a black buoy, with a staff and ball, bearing from the buoy of the Sunk S.S.W. $\frac{1}{4}$ W., distant 2 miles; and from Hunstanton lighthouse W. by N., distant $2\frac{1}{2}$ miles. This sand is a narrow strip, being a continuation of the sandy flat which surrounds the Sunk and Middle. Near the buoy there are only 2 feet at low water.

About $\frac{1}{2}$ a mile from the beacon-buoy on the Ferrer, is a red buoy, placed on the western edge of the Middle Ground which dries. These buoys bear S.E. and N.W. of each other, distant nearly $\frac{1}{2}$ a mile, and point out the entrance to the channel leading from the Gore Bay to Lynn Deep. Between the buoys is a *bar*, of 3 feet at low water.

LYNN DEEPS is that open space, bounded on the north by the Long Sand, and on the south by the Roaring Middle, Sunk, Middle, and Woolpack.

LYNN WELL is, properly, the Deep-water Channel, which stretches along the Lynn Deeps from abreast of the Lynn Knock, 2 or 3 miles, W.S.W. of the Well light-vessel.

The **LYNN WELL LIGHT-VESSEL** is placed a mile to the south-eastward of the Hook of the Long Sand, and exhibits two red lights, from separate lanterns, of equal heights. A gong is sounded during foggy weather, every 10 minutes; and a ball is carried at the mast-head. This vessel is moored in $22\frac{1}{2}$ fathoms water W.S.W. $\frac{1}{4}$ W., distant $10\frac{1}{2}$ miles from the beacon-buoy at the north end of Burnham Flats. From the light-vessel, Boston Church bears W.N.W. $\frac{3}{4}$ W.; Snettisham Church S. $\frac{1}{2}$ W.; and Hunstanton lighthouse S. $\frac{1}{2}$ E.

Those coming into the Well from the Lincolnshire coast, should bring the light-vessel to bear S.W. by W., which will carry them nearly a mile to the eastward of the Lynn Knock; and after rounding her to the southward, allowing for tides (the flood setting W. by N., in spring-tide, 4 to 5 miles per hour), they should steer W.S.W. $\frac{1}{4}$ W., about 5 miles, and anchor for the night, with the light-vessel bearing E.N.E., in 9 or 10 fathoms at low water.

The entrance to Lynn is blocked up by numerous *sands*, which stretch out from Hunstanton Point to the westward, full 9 miles, and consist of the *Stubborn, Ferrer, Pandora, Middle, Seal, Thief, Whiting*, and *Roaring Middle*; most of which are dry at low water, and covered at half-flood, the Roaring Middle excepted, which never dries. A black buoy lies on the outer edge of the Stubborn, leading to the Old Channel; but this Old Channel of Lynn having become very shallow, is now disused, while the Western Channel is much improved, and regularly buoyed.

HUNSTANTON LIGHT.—*Trinity House, London, 29th March, 1844.*—In compliance with the request of persons using the navigation of Lynn Well, this Corporation has caused the light exhibited in the Hunstanton lighthouse to be coloured red, in the direction of the shoal called the Roaring Middle; and masters of vessels and other persons navigating the said Well, are to observe, that the Hunstanton light will now appear of a bright red colour when bearing between E.S.E. and S.E. by E.

The **ROARING MIDDLE** is a narrow *sand*, running in a S.W. by W. direction, and forming the eastern boundary of the Western, or New Channel to Lynn. It is joined at its southern part to the Whiting, and has several buoys upon it. The outer buoy of the Roaring Middle is quartered black-and-white, and lies in $2\frac{1}{2}$ fathoms, with Hunstanton lighthouse bearing E.S.E. $\frac{1}{4}$ E.; the light-vessel N.E. by E. $\frac{1}{4}$ E., distant 6 miles; and the Sunk buoy E. $\frac{1}{2}$ N., distant 4 miles. This buoy does not lie at the northern extremity of the sand, for a *flat* extends E.N.E. $\frac{1}{4}$ N. from it, $\frac{1}{2}$ of a mile, having $2\frac{1}{2}$, 2, and at the north parts of the Middle only 1 fathom. There is also a northern Middle Bank, of 9 and 15 feet, $1\frac{1}{2}$ mile long, lying to the north-eastward of the buoy, which appears to be growing up, and promises ere long to join, and form a continuation of the Roaring Middle.

[NORTH SEA.]

In September, 1842, a new beacon-buoy was placed on the Roaring Middle Sand (No. 1), just below the high part of the sand.

Along the edge of the Roaring Middle are four other black beacon-buoys. These are to be left to the eastward, or port or larboard side, in entering the channel towards Lynn, which is thoroughly buoyed throughout with black-and-white buoys: the former are to be left on the port or larboard side, and the latter on the starboard. The channel between the third black buoy of the Roaring Middle and the opposite white buoy, called the Bell buoy, is $\frac{1}{2}$ of a mile wide, and the depth 7 fathoms; but from hence to Lynn, it becomes much narrower.

To the westward of the Lynn Channel are the Westmark Knock, Hull, and Breast Sands, which form the western limits of the Lynn Channel, and also the eastern side of the entrance to the Wisbeach Eye. The passage through the latter is also well buoyed. The outermost of these is black, and commonly called the Bar buoy, lying in 9 feet water, and bearing from the quartered buoy of the Roaring Middle W.S.W., distant 8 miles; and from the light-vessel S.W. by W. $\frac{1}{4}$ W., $8\frac{1}{2}$ miles. W. $\frac{1}{4}$ S., about $\frac{1}{2}$ of a mile from the outer black buoy, is a red one; and farther on, at nearly a similar distance, is another red buoy. There are also two others placed to mark the shallow western side of the entrance of Wisbeach.* These must be all left on the starboard side, and the black buoys of the Westmark Knock on the port or larboard. On this sand is a life-beacon, in case of shipwreck.† The channel is further marked out by black and white buoys; but a pilot is always necessary to be obtained for the navigation of these parts.

BOSTON.—The entrances to Boston are divided from that of Lynn by the Dog's Head, the Long Sand, the Roger, and Gatt Sands.

There is a passage between the Gatt Sands and the Roger Sand, which runs towards Boston. A red buoy marks its port or larboard side of entrance. This runs from the Wisbeach Bar buoy N. $\frac{1}{4}$ E., distant 2 miles. W. $\frac{1}{4}$ N. from this buoy, about a mile, is the Gatt buoy, lying on the edge of the sand, and coloured red also. W.N.W. $\frac{1}{4}$ W., about a mile farther, stands the Gatt beacon. These mark the northern limits of the Gatt Sand, and must be all left on the port or larboard side of Boston South Channel. On the north side of the channel, opposite the Gatt buoy, and distant from it $\frac{1}{2}$ a mile, lies the black Toft buoy; and W.N.W., 2 miles from the latter buoy, is the Toft beacon. These must be left on the starboard side. Near the first red buoy are 2 fathoms, and near the Gatt beacon, mid-channel, farther on, 4 $\frac{1}{2}$ and 6 fathoms. Having passed this beacon, the channel becomes more intricate and shallow. The passage is buoyed by black and red buoys, the former to the starboard, and the latter to the port or larboard. This is called the South Channel, and is joined to the North Channel by the Macaroni Channel. The North Channel is commonly called Boston Deep.

BOSTON DEEPS.—The entrance to Boston Deep is formed by the Dog's Head and the Outer and Inner Knock. Farther in is the Long Sand, which is joined, at the westward, to a large sand, called the Roger. These form the northern side of Lynn Well, as well as the southern side of Boston Deep. On the north side of Boston Deep lie the Skegness Middle, the two Knocks, and the Wainfleet Sands. There is also the Skulrig, which lies in the middle of the channel, and may be passed on either side.

The LYNN KNOCK is a narrow and dangerous bank, about 2 miles long, lying N.N.E. $\frac{1}{2}$ E. and S.S.W. $\frac{1}{2}$ W. It lies to the eastward of the Dog's Head and Long Sand, having between them a channel, with 5, 6, and 7 fathoms water in it. On it is a

* We are informed that the port of Wisbeach has been so much improved, that vessels of 400 tons burthen can now get into port with the greatest facility; and those of 200 tons, up to the town, and have comfortable berths.

† This beacon is about 34 feet above the level of the sand, and 38 feet above low water mark. It stands 300 yards from the depth of 3 fathoms at low water. The chains by which it is supported are fastened to 8 stones, each weighing 6 cwt. The mast is furnished with a chain and cleats, by which any person may ascend for safety, in case of shipwreck; and it has a round top, 6 feet in diameter, railed round, and adapted for the preservation of such persons. On the summit is a large triangular vane, 2 feet long, which may be seen from every point of the compass. At the distance of 2 or 3 miles, the beacon appears like a sloop at anchor, without a top-sail yard; and a vessel may be guided by its bearings up to the road.

black buoy with a small vane, lying in 5 feet water. At $\frac{1}{2}$ of a mile to the northward of the buoy is a *spot*, with but 9 feet water; it thence deepens to 3, 4, and 5 fathoms.

The leading-mark to clear Lynn Knock, on its eastern side, in 7 fathoms, is Hunstanton lighthouse on with Snettisham spire, S. by W. $\frac{1}{2}$ W. Snettisham spire on the west end of Hunstanton cliff, S. by W., leads to the westward of Lynn Knock, and very close to the Dog's Head, or Boston Bar.

THE DOG'S HEAD is a *sand*, covered at a quarter flood, and lies in a S.W. $\frac{1}{2}$ S. direction, full 4 miles, from which a *bar of shoal water* extends across the entrance, and joins the northern end of the Outer Knock. Two buoys are placed upon this bar, pointing out the proper channels between them; the southern buoy is red, and lies in 6 feet water. N. by W. $\frac{1}{2}$ W. from this red buoy, is a black beacon-buoy, with a ball; S.W. by S. from the beacon-buoy is another black buoy; and farther in, on the side of the Dog's Head, is a red buoy. This latter lies nearly S.S.W. from the second black buoy, distant $\frac{1}{2}$ a mile; and from the outer red buoy of the Dog's Head S.W. $\frac{1}{2}$ W., almost a mile. These black buoys, in entering, must be left on the starboard side, and the red buoys on the port or larboard. This forms the common channel into Boston Deep.* There is a swashway between the Dog's Head and Long Sand, with 4, 5, and 6 fathoms; but this is narrow, and too intricate for general use.

THE OUTER and INNER BOSTON KNOCKS are joined together, and now form one sand, running S.W. $\frac{1}{2}$ W. and N.E. $\frac{1}{2}$ E., being in length about $3\frac{1}{2}$ miles, and in breadth $\frac{1}{2}$ a mile. It is covered at half-flood, and has a swashway, leading between its southern end and the Wainfleet Sands, into Wainfleet Harbour. Besides the beacon-buoy and second black buoy, already noticed, there is a black buoy on its eastern edge, and a chequered buoy off its southern point, directly at the entrance of the swashway leading to Wainfleet.

THE WAINFLEET SAND is the N.E. part of extensive *flats*, which continue along shore, all the way to the entrance of the River Witham, the whole of which has a slope, or inclination, gradually but irregularly inclining from high to low water mark. Its edge is clearly defined, and, in general, steep-to, lessening suddenly from 4, 5, and 4 fathoms, to 12, 6, and 3 feet. There are 2 buoys placed on the inner part of Wainfleet Swash to point out the channel; one is black, on the north end of Wainfleet Sand, and the other is red, on the western point of the Inner Knock. On the edge of the Wainfleet Sands are 6 black buoys. The first, which lies about $1\frac{1}{2}$ mile beyond the Wainfleet Swash buoy, is on the outer edge of the Wainfleet Sand, and has 5 and 6 fathoms on its southern side. The next is the Friskney buoy, and lies 2 miles beyond the Wainfleet buoy. At $2\frac{1}{2}$ miles from the Friskney buoy, is the Wrangle buoy. At $1\frac{1}{2}$ mile farther on is the Leverton buoy. Then the Bennington buoy, about a mile from the Leverton. And lastly, the High Horn buoy, $1\frac{1}{2}$ mile beyond the Bennington. These, as before observed, are all black buoys, and must always be left to the northward.

THE SCULRIG is a narrow *sand*, lying parallel to the Wainfleet and Friskney Flats. Its length, from $3\frac{1}{2}$ fathoms at its north-eastern part to 4 fathoms on its south-western extremity, is $3\frac{1}{2}$ miles; but the middle part of the sand becomes dry at low water. Two red buoys are placed on its inner edge, the eastern buoy bearing from the outer red buoy of Boston Bar S.W. by W. $\frac{1}{2}$ W., distant almost $6\frac{1}{2}$ miles; and from the Friskney black buoy E.S.E. $\frac{1}{2}$ E., nearly a mile. The western buoy of the Sculrig is distant from the eastern buoy full $1\frac{1}{2}$ mile, and bears from it W. $\frac{1}{2}$ S. There is a passage on either side of the sand, the inner channel being $\frac{1}{2}$ of a mile wide, with 4, 5, $5\frac{1}{2}$, and 6 fathoms water. The outer channel, between it and the Long Sand, is $\frac{1}{2}$ of a mile wide, and has a depth of 6 and 7 fathoms.

The *Long Sand* lies in a circular form, projecting out to the south-eastward. It is a very broad and extensive sand, and covered in most parts at two-thirds flood. On the Hook of this sand there formerly stood a life-beacon; but this being repeatedly

* Captain Hewett observes, "The bar at the entrance of Boston Deep often shifts, and a direct course over it sometimes varies 3 or 4 points, to which due attention must always be paid on taking it. The quadrilateral figure, formed by the 4 buoys, is frequently altered, as the necessity for shifting them occurs; but, by steering a bold course, to pass about a cable's length from the large beacon-buoy, the colours and positions of the others will soon be manifest. The depth of water on this bar is usually from 11 to 14 feet at lower springs."

destroyed, the Well light-vessel, before described, has been moored in $22\frac{1}{2}$ fathoms at low water, about $\frac{1}{2}$ a mile to the south-eastward of the point where the life-beacon was placed.

The **ROGER** lies to the south-westward of the Long Sand, and may be considered to be a continuation of the same sand. It is, however, divided from it by a swashway, of 6 and 9 feet water. The northern part of the Roger has a considerable portion covered at a quarter-flood. Its southern part, called the Trap, and the Bar Sand, is also covered at one-third-flood. On the northern edge of the Bar Sand is a red buoy. This lies S.S.W. $\frac{1}{4}$ S., distant $\frac{3}{4}$ of a mile from the Bennington buoy. Between these are 5, 6, and near the Bar buoy, 8 fathoms. W. by S. $\frac{1}{4}$ S. from the Bar buoy, distant $2\frac{1}{2}$ miles, is a white buoy, placed at the entrance of the narrow channel, named the Macaroni, which leads between the Roger and the Hook Hill Sands into the Witham Channel. This passage is buoyed throughout with black and red buoys: the former must be left to the northward, and the latter to the southward. There is also another channel to the northward, between the Hook Hill Sand and the Herrion; but this passage must not be attempted without a pilot.

At the N.E. point of the Herrion Sand is a red buoy, serving to guide you into Clay Hole, where you may anchor, in 3 and $2\frac{1}{2}$ fathoms. The passage here has two other red buoys on the Herrion, and two beacons on the Frieston Scalp; the buoys to be left to the southward, and the beacons to the northward: these will be better understood by inspecting the chart.

DIRECTIONS FOR SAILING TO LYNN AND BOSTON.

SMALL vessels sailing from the southward for Lynn Deep, and well acquainted with the navigation, frequently go to the southward of Burnham Flats, between them and the shore, through Brancaster Roads and the Bays, into the Gore, their course from Blakeney being N.W. $\frac{1}{2}$ W., until Holkham Church bears S.W. by S.; then a N.W. by W. $\frac{1}{4}$ W. course will clear the Brid Girdle: do not bring the obelisk open to the westward of the church, until Brancaster mills come on with the middle of the Scald Heads. The mills well open of the west end of the Scald Heads, bearing S.W. by W. $\frac{1}{4}$ W., will carry you $\frac{1}{4}$ of a mile to the westward of the Brid Girdle, in the deepest water. Advance until you find yourself within $\frac{3}{4}$ of a mile from the shore. If you have not a flood-tide, bring-up, with Brancaster Church bearing S. by W.; or the Church and mill in a line, bearing S.S.W. $\frac{1}{2}$ W., and you will have from 12 to 15 feet at low water. This latter passage should not be attempted without the tide has sufficiently flowed; for both to the northward and westward of the Brid Girdle, within $\frac{1}{2}$ a mile of it, are *patches*, with only from 3 to 5 feet on them at low water. There is a passage to the southward of the Brid Girdle, with not less than 6 feet in it at low water. A W.N.W. course, 4 miles, from the Fairway buoy off Wells, will take you through it into Brancaster Roads, taking care to give the Scald Heads a berth of $\frac{3}{4}$ of a mile. But if with an easterly wind and flood-tide, you may pass the Brid Girdle, and run along the shore, at the distance of $1\frac{1}{2}$ mile; and after passing the Gore Point, you must enter Lynn Deep, near the Sunk buoy, or between the Sunk and Middle Bank, and you will come into good anchorage, with 6, 7, and 8 fathoms water. Here you can obtain a pilot.*

The space bounded by St. Edmund's, or Gore Point, and adjacent land, to the southward, and the Woolpack, Middle, and Sunk, to the northward, is called the Bays, and much frequented; but too hazardous to be attempted by strangers, unless through sheer necessity, or being driven there by violent gales from the eastward.

To sail out from the Bays, between the Middle and Sunk, bring Thornham Church on with Gore Point, bearing S.S.E. $\frac{3}{4}$ E.; but you must wait for the tide, agreeably to your draught of water; for between the Middle and Sunk there are only 3 feet at low

* The pilot sloops have always a broad vane; and when they require you to sail towards them, they place a blue or red jack under the vane. Pilots may be obtained in Lynn West Channel, Wisbeach Eye, and Clay Hole, for the respective ports of Lynn, Wisbeach, and Boston.

water, spring-tides: even a small vessel should not attempt this passage, until two-thirds flood.

To sail out between the Middle and Woolpack from the anchorage, where Brancaster Church and Mill are in one, you may steer a N.W. by N. course over the flats, with 9 feet at low water, and enter the Deepes at about $5\frac{1}{2}$ miles E.N.E. from the buoy of the Sunk, where you will have 6 fathoms water. Off the Gore Point the ground is foul and rocky, and dries, with spring-tides, almost a mile from the shore. To sail out between Burnham Flats and the Docking Sand, bring Addlethorpe Church well open to the northward of Ingoldsmel Church, and you will pass to the northward of the beacon-buoy, where there were 5 fathoms; but we have been lately informed, there is now much less water over the bar.

Large ships bound for Lynn or Boston, commonly proceed to the northward of Sherringham, the Race's, and Docking Shoals; therefore, being off Foulness, bring Cromer Light to bear S.S.W., distant 6 miles, to avoid the Sherringham; then steer N.N.W. $\frac{1}{4}$ W., 20 miles. This will take you a mile to the westward of the Dudgeon light-vessel; and when it bears S.E. by E., distant a mile, steer W.N.W., 6 miles, for the red buoy of the north end of Race's Bank, allowing for the tide. A west course from the latter buoy, 2 miles, will bring you to the chequered buoy on the north end of the Docking Sand. When a mile to the westward of the latter buoy, a S.W. by W. course, 15 miles, will bring you up to the light-vessel in Lynn Well. From the light-vessel, steer W.S.W. $\frac{1}{4}$ W.; and having passed the light about 5 or 6 miles, bring it to bear between E.N.E. and E.N.E. $\frac{1}{4}$ E., and anchor, in 12 to 7 fathoms. In estimating your distance, great regard must be had to the tides, the flood or the springs setting to the westward at the rate of 4 miles an hour. When working up for Lynn Deepes, Hunstanton light on with Snettisham spire, or the light S.W. $\frac{1}{4}$ W., will carry you on the eastern side of the Lynn Knock, which is the best route by night. To sail between Lynn Knock and the Dog's Head, bring Gaywood Church, near King's Lynn, to bear S.S.W. $\frac{1}{4}$ W., or if that object should not be visible, keep midway between the Dog's Head and the Knock. Snettisham spire, over the west end of Hunstanton cliff, will carry you to the westward of Lynn Knock, but very close to the Dog's Head. This passage may be dangerous, and should, therefore, be adopted with much care. When midway between the Lynn Knock and Burnham Flats, in 16 or 17 fathoms, your soundings will be mud; towards the Flats, fine brown sand, and near the Knock, fine sand, and sand with black specks; but as you advance towards the Hook of the Long Sand, you will have coarse sand, gravel, and shells; therefore, when Hunstanton lighthouse bears from S. $\frac{1}{4}$ W. to S. by E. $\frac{1}{4}$ E., stand on no farther than 20 fathoms, for near to the Hook are 18, then 9 fathoms, and before you can haul in the lead, you may be aground. To the eastward you may stand into 16, 14, or 12 fathoms safely enough; but beware, especially at night, how you get over to the westward. Be always particular and careful to make proper allowance for wind and tide; for off the Lynn Knock and the Hook, spring-tides often run 5 miles an hour, neaps $2\frac{1}{2}$, the rise being with the former 4 fathoms, and with the latter 14 feet.

When the flood first overflows the Long Sand, the tide will run strongly over it from the eastward; then you should always bring-up in time; for with light winds, you will otherwise not be able to clear it. The direct course from the light-vessel to the black-and-white quartered buoy, is S.W. by W. $\frac{1}{4}$ W., and the distance 6 miles. Having arrived at which, proceed towards Lynn, as before directed, leaving the black buoys on the port or larboard side, and the white buoys on the starboard.

To sail into Boston Deepes, having brought Addlethorpe Church well open to the southward of Ingoldsmel, you will be able to see the Knock and Dog's Head buoys. Bring Addlethorpe to bear N.N.W. $\frac{1}{4}$ W., distant $4\frac{1}{2}$ or 5 miles, and run for the black beacon-buoy of the Outer Boston Knock. Wait the flowing of the tide for a proper depth over the bar, suitable to the draught of water your vessel requires. The course in from abreast of the Outer Boston Knock buoy, will be nearly S.W.: this will take you to the first black buoy, and quite over the bar; but, as observed in page 43, the bar frequently shifts, and consequently the position of the buoys are altered. Having passed over the bar, the channel becomes deeper and wider. A S.W. by W. course will carry you past the second black buoy of the Inner Knock, towards the east buoy of the Sculrig. Sail on either side of the Sculrig, and anchor where convenient; the best place is above the Sculrig.

The Sculrig's eastern buoy lies S.W. by W. $\frac{1}{4}$ W., distant more than $6\frac{1}{2}$ miles from

the outer red buoy of Boston Bar. The channel between the Sculrig and Wainfleet is $\frac{1}{2}$ of a mile wide, and has 5 and $5\frac{1}{2}$ fathoms water within it. Between the Sculrig and Long Sand it is $\frac{1}{2}$ a mile wide, with 6, 7, and 8 fathoms. When past the Sculrig it becomes $1\frac{1}{2}$ mile wide; but as you advance to the westward, it gradually narrows. The sands on both sides are steep, especially the Long Sand. Ships generally anchor between the Wrangle and Leverton buoys, and wait for a pilot to carry them through the New Channel to the Scalp, where they lie aground, upon soft clay.

Off Boston Bar buoys the tide of flood runs S.S.W., as far as the Hook of the Long Sand, where its direction alters to W. by S. and west. Off Lynn Knock it sets W. by S.; ebb-tides the contrary way. When you are near the Dowling, or Docking Sand, you will have within them the tide, on the first of the flood from the N.E., then E. by N.; and the first of the ebb from the S.W., and thence round to W. by S. Outside of these sands the spring-tides never slacken; for when you bring-up there, you will find the first quarter-flood from the N.W.; second quarter from the N.E.; the last half-flood and the first-quarter ebb from the east to the S.S.E.; half-ebb to low water from S.W. to W.N.W.; and the strength of the tide continually the same, being $2\frac{1}{2}$ or 3 knots an hour. On the east side of the Well, near the Woolpack and Sunk, the ebb runs from W.S.W., and the flood the contrary; and from the Sunk buoy to Lynn Roads, the ebb-tide runs from the S.W., and the flood N.E. Observe, all over the Well, on spring-tides, the velocity is $3\frac{1}{2}$ knots. The water often flows 4 fathoms in height, so that you should be careful in noticing what time of the tide you bring-up in, that you may have sufficient depth to ride afloat.

WAINFLEET ROAD and HARBOUR.—If bound to Wainfleet, your passage is to the northward and westward of the Boston Knock, and between it and Skegness Middle. This latter sand stretches out towards the north-east, its outermost point being full $5\frac{1}{2}$ miles from Gibraltar Point, from which it bears N.E. $\frac{1}{2}$ N.; and $2\frac{1}{2}$ miles from the beacon-buoy of the Outer Knock, from which it lies N. $\frac{3}{4}$ W., and nearly a mile from the shore. Between the Boston Knock and Skegness Middle, are from 3 to 2 fathoms; and small vessels generally anchor at the farther end, or western part, it being opposite to the swashway which runs into Boston Deep. Be careful not to get in to the north-westward of the Skegness Middle, between it and the shore, mistaking it for the proper channel, for such error may prove dangerous: this, however, may be avoided, by not coming nearer than into $3\frac{1}{2}$ fathoms water. When you are abreast of the middle part of Skegness Middle, the northern Skegness House will bear W.N.W.; and when the southern house, or Old Hotel, comes W.N.W., you will have passed the sand, and may run on so far as Sykes's House, which is the southernmost house on that shore, observing to bring it to bear N.W.; then anchor, in 3 or $3\frac{1}{2}$ fathoms, good ground; but if wishing to go into Wainfleet Harbour, with a vessel drawing not more than 8 or 9 feet, get under weigh at half-flood, if spring-tide; or the last quarter, if neap-tide. Haul round the point, passing the buoy upon it as near as you conveniently can, and before you reach Gibraltar Point, when you will perceive two beacons: bring them in one, until you are abreast of the upper one; then anchor. But should night come on before you get sight of the Skegness Houses, you should not advance into less than 4 fathoms, which will enable you, at leisure, to go between the Inner Knock and the main. At the entrance you will have 6 and 5 fathoms; then shoaling as you advance to $3\frac{1}{2}$ and 3 fathoms, where the lead will be found to hold fast, and stick to the bottom, indicating the proper place to anchor. Vessels which, with south, S.S.W., and S.W. winds, cannot conveniently ride in Lynn Well, frequently run for this place, and ride perfectly safe.

At Gibraltar Point it is high water at 6 o'clock, full and change; and the tides generally rise from 16 to 20 feet.

FROM BOSTON AND LYNN DEEPS TO THE HUMBER.

Description of the Shoals, &c.

IN sailing from Boston Knock towards the Humber, there are several *overfalls* and *sandy flats*: these are the *Clay Huts*, *Trusthorpe Overfalls*, *Thoddlethorpe Middle* and *Overfalls*, *Saltfleet* and *Protector Overfalls*, the *Rose Sand*, and the *Sandhills Flats*,

The **CLAY HUTS** are lumps, or elevations of hard clay, lying about $1\frac{1}{2}$ mile to the southward of Trusthorpe Church, and run out nearly $\frac{1}{2}$ of a mile from shore, having from 4 to 8 feet upon them, and 2 fathoms close to their eastern side.

TRUSTHORPE OVERFALLS lie from east to E.S.E., nearly $3\frac{1}{2}$ miles from Trusthorpe Church, with only $3\frac{1}{2}$ fathoms over them at low spring-ebbs. They consist of four patches, having 5 and $5\frac{1}{2}$ fathoms between them.

THEDDLETHORPE MIDDLE lies full 3 miles to the southward of Saltfleet, and about $1\frac{1}{2}$ mile from the shore, to which it runs parallel. Close to its eastern side are $8\frac{1}{2}$ fathoms; but over the sand are no more than 3 feet at low water; and the passage between it and the main is only fit for boats.

THEDDLETHORPE OVERFALLS.—These are several patches, lying nearly E.S.E. from Theddlethorpe Church, about 3 miles distant from the shore, and have 3 and $3\frac{1}{2}$ fathoms over them.

SALTFLKET OVERFALLS consist of several patches, with from $2\frac{1}{2}$ to $8\frac{1}{2}$ fathoms on them, with 5 and 7 fathoms between them: they bear from Saltfleet from E. by S. $\frac{1}{2}$ S. to S.E. $\frac{1}{2}$ E. The outer part of these shoals lie 5 miles from the land.

THE ROSE SAND commences near Saltfleet, and from thence runs N.N.E., $3\frac{1}{2}$ miles, to near the Sandhaile Flats, and has only 1 and 2 feet upon it. Its northern end lies E.S.E., 3 miles from Donna Nook beacon. There are 10 or 12 feet water within it; but at its southern end there is scarcely a passage for a boat at low water. Along the eastern edge of this sand are from 10 to 18 feet water.

PROTECTOR OVERFALLS.—The north end of these shoals lie with Saltfleet bearing W.N.W., nearly, distant 8 miles. From thence they run south, 2 miles, and are about $\frac{1}{2}$ a mile broad, with from 9 feet to 3 fathoms on them. From the patch of 9 feet, Saltfleet bears N.W. by W. $\frac{1}{2}$ W., distant 8 miles; Trusthorpe Church W. by S. $\frac{1}{2}$ S., 7 miles; and the beacon-buoy on the north end of the Inner Dowsing S. by E. $\frac{1}{2}$ E., 8 miles; and the Silver Pits, in 40 fathoms, bear from E. by N. to E.S.E., $8\frac{1}{2}$ miles; between which is an extensive flat, with from 6 to 9 and 10 fathoms, when you fall suddenly into from 40 to 50 fathoms, when in the latitude of Saltfleet, at 16 miles from the land. These overfalls are dangerous at low water, and lie very much in the way; therefore, a ship should not approach the land when in this neighbourhood, within 3 leagues; and when you are beating in thick weather, you should take your soundings from the Silver Pits, when you will be certain of your distance from them. About a mile south of the south end of the above shoal, are two more patches, of 3 and $3\frac{1}{2}$ fathoms, about $\frac{1}{2}$ a mile in extent. A north course from the Inner Dowsing buoy, will carry you to the eastward of the above shoals.

SANDHAILE FLATS is an extensive shoal, running out 5 miles from the Lincolnshire coast. Its northern edge lies in a north-easterly direction from Saltfleet Church, and its south-eastern extremity, in 4 fathoms, bears E. by N. from the Saltfleet windmill, distant $5\frac{1}{2}$ miles, and about S.S.E. from the high lighthouse at the Spurn. Patrington Church clear of the Spurn Point Sand-hills, bearing N. by W. $\frac{1}{2}$ W., will lead over the eastern part of the flat, in 3, $3\frac{1}{2}$, and 4 fathoms; from hence it bends circularly to the northward and westward, so far as the entrance of Tetney Haven, and towards Clea Ness, thereby forming the western boundary of the entrance to the Humber. This sand gradually decreases its depth towards the land, and becomes dry above a mile off. Clea mill on with Grimsby Church, leads clear over its northern part, in 3 and $3\frac{1}{2}$ fathoms water; and when the high lighthouse comes E.N.E., you will be abreast of the entrance to Tetney Haven.

By a notice from the Trinity House, Hull, dated 18th November, 1839, we are informed, that a red buoy has been placed on the pitch of the Sandhaile, with the Spurn high lighthouse bearing N. by W. $\frac{1}{2}$ W.; the New Sand light-vessel N.E. $\frac{1}{2}$ E.; and the Donna Nook beacon S.W. $\frac{1}{2}$ W.

DONNA NOOK BEACON.—On a point of land N. $\frac{1}{2}$ E., $3\frac{1}{2}$ miles from Saltfleet, a beacon has been erected, of a conical form, with a triangular cap on its top, painted red, 50 feet high, and may be seen, in clear weather, more than 3 leagues off. Near this beacon is a life-boat house.

DIRECTIONS FOR SAILING FROM BOSTON AND LYNN DEEPS
TO THE HUMBER.

TO sail from Lynn or Boston Deepes for the Humber, the direct route for a small vessel is within the Inner Dowsing—that is, between it and the shore. Taking therefore your departure from abreast of the Lynn Knock, a mile to the eastward of the buoy, a N. by E. course, for 9 leagues, will carry you towards the mouth of the river, to where the Spurn lights are in one, distant 8 miles. In steering the latter course, you will have to pass between the Saltfleet and Protector Overfalls, on which there are some *patches*, with from 9 to 13 feet at low water, spring-tides; but remember, proper allowance must be made for the set of the tides. Or, proceeding from Boston Bar, steer N.N.E., 4 leagues; and thence N. by E., until you bring the Spurn lights in one, bearing N.W. $\frac{1}{2}$ N.; and steer in that direction, until the light-vessel comes N. by E., distant a mile. In a large ship you should pass outside the Inner Dowsing and the Protector Overfalls, by steering from the light-vessel in Lynn Deepes N.E. by E., 15 miles. This will bring you within a mile to the westward of the chequered buoy on the north end of the Docking Sand, in 12 or 13 fathoms. From this situation steer N. by E., 10 miles, along the east side of the Inner Dowsing. Then a N.N.W. course, 10 miles, will bring you to the entrance of the Humber, where you have the lights in one.

Vessels taking their departure from Foulness, and bound into the Humber, should go to the westward of the Dudgeon light-vessel, steering N.N.W. $\frac{1}{4}$ W. from abreast of Foulness, when bearing S.S.W., about 6 miles distant; and having passed the vessel, a N.N.W. $\frac{1}{4}$ W. course will take them to the Humber; but should you wish to go to the eastward of the Dudgeon Shoal, then sail from Foulness N. $\frac{1}{4}$ W., about 8 leagues from the before-mentioned position (Cromer S.S.W., 6 miles), and thence N.W. $\frac{1}{4}$ N., 9 leagues, which will bring you near the Spurn light-vessel; but the mariner must be particularly attentive to the set of the tides, which will be noticed hereafter.

THE RIVER HUMBER.

Description of the Sands, Buoys, &c.

THE entrance to this river is bounded to the southward by Sandhail Flats (already described), and to the northward by the Stone Banks, or Binks, New Sand, and South Knoll, or Chequer Sand. Two remarkable lighthouses are erected on the Spurn Head, which can be seen at a considerable distance, and sufficiently point out the mouth of the river.

THE STONE BANKS, called also the *Outer* and *Inner Binks*, are hard rocky *shelves*, running out from the Spurn Land, with a narrow but shallow channel between them. This channel runs round the point towards Kilnsey, and is fit only for light craft, who are previously well acquainted with its navigation. The *Stone Banks* consists of three or more *knolls*, of 3 and 6 feet water, having some parts which occasionally appear above water; they are distinguished by the names of the *Inner*, *Middle*, and *Outer Bank*; the Inner Bank lies S.S.E. from the high lighthouse, and almost joins the Spurn Point; the Middle Bank is separated from the Inner Bank by a swashway, of 3 to 6 feet water. Upon this bank are *two patches*, which often dry, while adjacent to them there is not above a foot at low water. This bank lies directly to the eastward of the Inner Bank, from which it is distant about $\frac{1}{4}$ of a mile. The Outer Bank has from 5 to 12 feet over it, and lies E. $\frac{1}{4}$ S. from the high lighthouse, distant 3 miles. To go clear to the eastward of this bank, bring Dimlington Heights well open, and their highest part to bear N. by W. $\frac{3}{4}$ W. On the southern and eastern edges of these sands or binks, there are three black buoys, the middle one having a staff and ball.

THE NEW SAND is to the south-eastward of the Stone Banks. E. by S. of the New Sand are some spots, of 3 and 4 fathoms, and with the ebb-tide strong rippings

extend in that direction full 2 miles from the buoy, so far out as 7 fathoms; but beyond that is a channel, of 10, 12, 15, and 17 fathoms, running to the southward of the light-vessel and Chequer Bank. A quarter of a mile on the outside of the black-and-white buoy of the Chequer, are 9, 10, and 12 fathoms.

THE SOUTH KNOLL, or CHEQUER BANK, is a *square patch*, lately grown up to the south-westward of the New Sand, and lies directly in the channel way, the least water over which is, at present, about 19 feet at low spring-ebbs. A chequered black-and-white buoy is now laid there, with the following marks:—the Spurn high light, bearing N.W. by N., distant $2\frac{1}{2}$ miles; and Kilnsey Church (now in ruins) N. $\frac{1}{2}$ E. In the night, a red-coloured light is shown from the high lighthouse, between the bearings of N.W. by W. and N.N.W. $\frac{1}{2}$ W., a sector comprehending the New or Chequer Shoal. On the last bearing the red light disappears, and the bright light comes again in sight.

A LIGHT-VESSEL is now moored, in 9 fathoms water, distant rather more than $4\frac{1}{2}$ miles from the Spurn high lighthouse, within Dimlington cliff, N. $\frac{1}{2}$ W., $6\frac{1}{2}$ miles; Kilnsey Church N. by W. $\frac{1}{2}$ W., $4\frac{1}{2}$ miles; the chequered buoy on the South Knoll W. $\frac{1}{2}$ S.; and the Spurn high light N.W. by W. In this vessel a red light, revolving every $\frac{1}{2}$ minute, is constantly exhibited during the night, which may be seen 9 miles, and a ball by day; also, during foggy weather, a gong is sounded every 10 minutes.

The following Trinity House Notice was issued on the 3d of November, 1829.—“It having been represented to this Corporation, that masters of vessels and others navigating in the vicinity of the Spurn Point, do not use sufficient caution, in crossing the Humber, to give the floating light-vessel a good berth, and to keep on the outside of her; in consequence of which want of care and attention, two vessels have recently run foul of the said light-vessel; masters of vessels and others are hereby cautioned to be more attentive to give said light-vessel a good berth in crossing the Humber; and they are hereby apprised, that, after this cautionary notice, the penalties imposed by the Act 6 Geo. IV. c. 125, will be levied on the owner or master of any ship or vessel which shall run foul of the said floating light.”

The CHANNEL into the Humber, between the Chequer buoy on the north and the Sandhaile buoy on the south, is $2\frac{1}{2}$ miles wide. The greatest depth of water will be found by inclining to the north side of the passage, where you will have 10, 11, and 12 fathoms very near to the Chequer Sand, gradually decreasing in depth towards the Sandhaile Flats. Within the Humber, on your passage to Kingston-upon-Hull, which is above 6 leagues beyond the Spurn Head, you will meet with several sands, viz.:—the *Bull, Clea Ness, Middle, Burcum, Trinity, Sunk, Foulholm, Paull, and Skitter Sands.*

THE BULL SAND is about $1\frac{1}{2}$ mile long and $\frac{3}{4}$ of a mile broad, lying in the direction of N.N.W. and S.S.E., and having $4\frac{1}{2}$ to $3\frac{1}{2}$ fathoms upon it. On its eastern side is a red buoy, with the Spurn high lighthouse bearing E. by N., distant $1\frac{1}{2}$ mile; Patrington Steeple N. $\frac{1}{2}$ E.; and Clea Ness buoy N.W. by N. In mid-channel, between the Spurn and the Bull, are from 6 to 11 fathoms at low water.

BULL LIGHT-VESSEL.—A light-vessel is moored off the south-east end of the Bull Sand, having a red light shown from a single lantern, constantly continued from sun-set to sun-rise. This vessel is moored in $4\frac{1}{2}$ fathoms at low water, spring-ebbs, about $1\frac{1}{2}$ mile from the Spurn Point, and about $\frac{1}{4}$ of a mile from the south-east end of the Bull Sand, with the Spurn high light bearing E.N.E. The above vessel shows a ball during the day-time, and in hazy or dark weather a gong is sounded.

CLEA NESS SAND is part of the sand already mentioned, extending from Sandhaile Flats, and here runs out from the Ness to the eastward full $2\frac{1}{2}$ miles, and then turns towards Grimsby and Stallingborough, the inner part drying at low water; a black buoy now lies at the point of the sand, bearing E. by S. from Grimsby Church, and N.W. by W. from the Spurn high light, distant $3\frac{1}{2}$ miles. In a direct line from the Spurn to this buoy are, 8, 5, 6, 5, and $4\frac{1}{2}$ fathoms, the least depth being about a mile from the Spurn lights.

CLEA BEACON.—According to a notice from the Corporation of Trinity House, Hull, dated August 13, 1834, a new beacon has been erected on Clea Common, for the use of vessels entering the Humber. The beacon is 60 feet high, of an octagonal form, [NORTH SEA.]

and painted black. A vessel will clear the western edge of the Inner Banks, by keeping Grimsby Church on with this beacon, bearing N.W. by W. $\frac{1}{2}$ W.

The MIDDLE is a narrow irregular sand, lying directly in the fairway of the channel. Two white buoys are placed upon it, as a guide to vessels going into or out of Hawk Roads. The eastern white buoy lies in $3\frac{1}{2}$ fathoms water; the western buoy in 4 fathoms. The general depths upon it are $3\frac{1}{2}$, 4, and 5 fathoms. The eastern buoy bears from the high light nearly N.W., distant 3 miles; the western buoy of the Middle bears from the eastern buoy N.W. $\frac{1}{2}$ W., distant $1\frac{1}{2}$ mile; and from Clea Ness buoy N. by W. $\frac{1}{2}$ W., $1\frac{1}{2}$ mile. From this buoy Patrington Church steeple bears N.N.E., and Grimsby Church W. $\frac{1}{2}$ S.; between the Middle and Clea Ness buoys are 5, 6, and 7 fathoms; but as you approach towards the white buoy, your soundings will decrease to 4 and $3\frac{1}{2}$ fathoms.

The BURCUM is a long and narrow sand, stretching in nearly the same direction as the shore; on its eastern end lies a black buoy, in 9 feet water; this buoy bears directly west from the western buoy of the Middle, distant $1\frac{1}{2}$ mile; from Clea Ness buoy N.W. by W. $\frac{1}{2}$ W., $2\frac{1}{2}$ miles; and Grimsby Church bearing W. by S. $\frac{1}{2}$ S. This sand runs up beyond Stallingborough Kilns, drying in parts, particularly towards its eastern end. Between the buoy of Clea Ness Sand and the Burcum, is the Inner Roads, or channel into Grimsby new dock. Between the Middle and Clea Ness Sand are from 4 to 7 fathoms water; between the Burcum east end and the west end of the Middle are 4, 5, and 6 fathoms; but in the Inner Roads, which is to the south-westward of the Burcum, it shallows to 6 and 3 feet, with a very soft bottom of clay and mud.

The TRINITY SAND lies on the north side of the Humber, and joins others which line the shore, and are very extensive; its S.E. end lies about N.N.W. from the Spurn high light, and thence runs along 3 miles, towards the Sunk Sand, being divided from the shallows which surround the Spurn by a channel, commonly called Patrington North Channel, in which are 12, 9, 6, and 3 feet at low water. The Spurn Flat is composed of soft mud, which dries a mile from the shore. The Trinity Sand is a bank of mud and sand, divided from the Sunk Sand by a narrow channel, which runs up to Patrington, and is pointed out by several beacons, many of which have a bush fixed on their tops. This is called the Patrington West Channel. The south-western edge of the Trinity Sand dries, and is gradually to be approached by a flat, of 9, 6, 3, and 2 feet; but in the Hawk Roads are from 6 to 13 fathoms.

The SUNK SAND extends from the Patrington West Channel along the southern side of the Sunk Island, in a N.W. by W. $\frac{1}{2}$ W. direction, until you come to a white buoy, which lies on the edge of a spit, and bears from Patrington steeple W. S. W., from the Sunk Chapel S.W. $\frac{1}{2}$ S.; and from the western buoy of the Middle N.W. $\frac{1}{2}$ N., distant $4\frac{1}{2}$ miles. A shallow ridge runs off to the S.E. $\frac{1}{2}$ E. of this buoy, called the *Sunk Spit*, having at its extremity only 7 feet. Great care must be taken to avoid this when passing through the Sunk Roads, by giving this part a wide berth.

FOULHOLM SAND.—N.W. by N., distant about $3\frac{1}{2}$ miles from the white buoy of the Sunk Spit, begins the dry part of the Foulholm Sand, which joins the Paull Sand to the northward, and becomes a dangerous and extensive bank. There is a channel within it, leading to Stone Creek, and towards the town of Paull, or Paghill; but this is only to be used by small coasting vessels. The common passage is to the westward of these sands. There is a sandy flat of shallow water lying off the southern part of the Foulholm, upon which is a white buoy; and nearly 2 miles beyond the white buoy, is a chequered buoy, painted black-and-white. There is also a chequered red-and-white buoy, bearing S.E. by E., about a mile distant from the white buoy. These all lie on the western edge of the sand, and must be left to the eastward, or starboard side. The channel here is about $\frac{1}{2}$ a mile wide, and has a depth of 10, 9, and 8 fathoms water.

KILLINGHOLM and PAULL LIGHTS.—By a notice issued from the Trinity House, Hull, dated December 10th, 1836, two lighthouses have been erected near the bank of the river at South Killingholm, and one at Paull, or Paghill. The high light at Killingholm is 50 feet high, and the low light 35 feet. That at Paull is 30 feet. All these are fixed, or stationary, bright lights.

HALTON MIDDLE GROUND.—The south end of this sand lies nearly $\frac{3}{4}$ of a mile N.N.W. $\frac{1}{2}$ W. from the chequered buoy of the Foulholm, and runs in a northerly direction to the southern black buoy of the Skitter Sand, a distance of 4 miles. On it are 3, 2 $\frac{1}{2}$, and 2 fathoms. Between its southern end and the Lincolnshire shore are 10, 9, 8, 6, and 5 fathoms, in a place opposite Killingholm Haven, called Whitebooth Road.*

THE SKITTER is a circular sand, beginning abreast of the above black buoy, and extending beyond the western end of Hull; but the sandy flat may be said to commence at Whitebooth Road, and continue so far as Barton Ferry. Four black buoys now mark the outer edges of the Skitter Sand, which extends 1 $\frac{1}{4}$ mile from the south-western shore, stretching out more than half-way across the navigable part of the channel. The first, or southern black buoy, lies in 2 $\frac{1}{2}$ fathoms, with Paull lighthouse bearing east, distant $\frac{3}{4}$ of a mile. The second buoy is a good mile beyond the first, and bears from the above jetty N.W. $\frac{1}{2}$ N., distant 1 $\frac{1}{4}$ mile; and the third black buoy is $\frac{3}{4}$ of a mile beyond the second, from which it bears N.W. $\frac{1}{2}$ W., being opposite to the buoy of the Hebbles. The deep-water channel is here only $\frac{1}{4}$ of a mile wide, but has a depth of 7 fathoms.

A black buoy, marked "Elbow," has been laid down on the easternmost extremity of the Skitter Sand, about $\frac{1}{4}$ a mile to the northward of the said sand end. The buoys lie between the Anson and the Skitter Sand end buoys, in about 3 fathoms at low water.

THE HEBBLES is a narrow sand, stretching along shore about $\frac{3}{4}$ of a mile, affording a passage for small craft within it. On its western end, a white buoy has been placed, in 4 $\frac{1}{2}$ fathoms, half-ebb, neap tides. This lies with the two mills at Stoneferry in a line, and Hedon mill on with the throat of Marfleet jetty. It bears from the western buoy of the Skitter Sand N.E. $\frac{1}{2}$ N., distant $\frac{1}{4}$ of a mile. Opposite to the town is a long middle sand, with 4 to 6 feet on it at low water, having, on the east end, a buoy, chequered black-and-white, bearing N.W. by W., $\frac{1}{4}$ a mile from the west black buoy of the Skitter. On the north side of the middle, a mile from the first, is a second chequered black-and-white buoy.† Hull Road is to the northward of these buoys.

DIRECTIONS FOR SAILING UP THE HUMBER.

HAVING brought the Spurn lights in one, which will then bear N.W. $\frac{1}{2}$ N., proceed boldly on, until the light-vessel bears N. by E.; you will then be about 1 $\frac{1}{2}$ mile from the light-vessel, and 5 miles from the high lighthouse; then steer W.N.W., until the light-vessel bears E. $\frac{1}{2}$ N., but not more to the eastward; you will then have passed the chequered buoy to the southward, and may haul up more to the northward, and pass between the Spurn lighthouse and the Bull light-vessel, proceeding either to Hawk Road or towards the Clea Ness buoy.

Vessels from the northward, bound to the Humber, should not bring Dimlington high land, on which is a beacon, to the northward of N. by W. $\frac{1}{2}$ W., in order to avoid the Outer Stone Bank, or Binks, the New Sand, &c.; and having passed it, should

* NOTICE TO MARINERS.—*Trinity House, Hull, December 8th, 1845.*—This Corporation hereby give notice, that the Middle Sand at the lower part of Whitebooth Road, in the River Humber, has recently laid up, chiefly in mid-channel. The marks and bearings of the shoal are now as follows, viz:—Immingham Church, $\frac{1}{2}$ a ship's length to the westward of Killingholm low lighthouse, S.W. by S.; Killingholm Church S.W.; Mother Brown's house at North Killingholm Haven N.W. by W.; and Holm Hook buoy S.E. by E. There are 11 feet on the shoalest part at low water, spring tides; and between the said shoal and Holm Sand, from 5 to 4 $\frac{1}{2}$ fathoms; and to the westward, between it and the main land, from 9 to 10 fathoms.

† According to a notice from the Trinity House, Hull, dated December 26th, 1839, a light-vessel is now moored in about 4 fathoms water, on the south side of the Hebbles Channel, between the two N.W. black buoys of the Skitter. The vessel has a fixed red light, about 20 feet high, shown every night from sun-set to sun-rise, and carries a ball at the mast-head.

also go to the eastward and southward of the light-vessel, giving it a fair berth; and, in hauling to the westward, be careful not to bring her to bear more easterly than E.N.E., until the high lighthouse bears N.N.W.; then proceed to the westward, as already directed.

Great attention must be paid to the setting of the tides, for the ebb runs strong over the Stony Binks from the southward, and the flood equally so in an opposite direction; therefore, more strict attention must be given to the bearings than to the courses steered, as all depends upon the rate the ship is going. Spring-tides run $4\frac{1}{2}$ knots, neaps 2 knots an hour; but the ebbs in the freshes run with more rapidity.

Captain Hewett's chart directs Dimlington Heights to be kept well open, the highest part bearing N. by W. $\frac{1}{4}$ W., which clears the north-eastern point of the Outer Bank; and when the light-vessel bears S. by W., steer towards it, when a W. $\frac{1}{4}$ S. course will take you past the buoy of the Chequer Sand; and when the high lighthouse comes N.N.W., steer N.W. $\frac{1}{4}$ N., and it will carry you to the northward of the Bull Sand, and up to the black buoy of Clea Ness and Grimsby Road.

In thus advancing up the Humber, you should not borrow upon Sandhaile Flats, unless the wind be from the south-westward; for, with a S.E. wind, if you were to run along in 4, 5, and 6 fathoms, you would not be able, with a flood tide, to weather the N.E. hook. If with easterly or N.E. winds, you should pass the Spurn, your best anchorage will be in the Hawk Roads; but if with a southerly or S.W. wind, Grimsby Road will be preferable; therefore, should the former prevail, you will find the ground good in the Hawk, riding in 5 and 6 fathoms, the Spurn Point bearing S.S.E., distant 2 miles. Pay proper attention to the tides, for springs rise 26 and 28 feet, and neaps from 12 to 16 feet; by doing which, you will always be assured of sufficient water to ride in.

If desirous of going farther up from Hawk Roads towards Sunk Island, you should steer N.W. $\frac{1}{4}$ N., until you have passed the white buoy of the Middle on the port or larboard side, coming no nearer to the Trinity Sand than 6 or 7 fathoms; then shape your course more westerly for Sunk Roads. The channel north of the Middle is above a mile wide, and has 6, 7, 8, and 9 fathoms within it. You will find good riding off Sunk Island, with Humberstone Church on with Clea mill, bearing S. by W., in 6 or 7 fathoms; or may go higher up, and anchor beyond the white buoy of the Sunk Spit, with Patrington steeple and the chapel on Sunk Island in one, bearing E. $\frac{3}{4}$ N., in a depth of 6, 7, 8, 9, and 10 fathoms; from hence you may proceed to Kingston, as directed hereafter.

We have stated, that Grimsby Road, with southerly and S.W. winds, is preferable to Hawk Road. Those who intend to anchor there, should steer about N.W., along the east side of the Bull Sand, in 6 and 7 fathoms, until the low light comes a handspike's length open of the high light, then bearing S.E. $\frac{3}{4}$ E. Keep on with the lights in this direction, which will carry you between the Middle on the one side, and the Clea Ness Sand and Burcum on the other.

After you have passed the buoy on Clea Ness Sand, leaving it on the port or larboard side, and got about three-fourths of the way towards the black buoy on the S.E. end of the Burcum, you will be in Grimsby Road. There large ships lie a little outside of the stream of the buoy, in 5 or 6 fathoms; but small vessels may ride in the Inner Roads within the buoy, with Grimsby Church tower bearing W. by S., or a little below it, in from 10 to 15 feet, a mixture of clay and mud, very soft. Regard must be paid to the time of the tide when you anchor, and also whether spring or neap. The Grimsby Haven Company have constructed a wet dock, with flood-gates, sluices, and other requisite buildings. The lock within the haven is 160 feet long, about $\frac{1}{4}$ of a mile distant from the Humber, having a depth of 12 feet at the lowest neap-tides, with ordinary springs 20 feet, and with high springs 28 feet. A depth of 18 feet is penned up in one part of the lock, and 14 feet at the extremities, by the sides of the town. The whole excavation is about 18 acres, affording ample room for 250 ships to load and discharge, besides sufficient space for passing. In addition, there is also a dry dock, besides a building-yard, and various private docks for bonding timber and other goods. Should a vessel, bound to Grimsby, arrive there during neap-tides, she will find safe anchorage in the roads until the following springs; and the same wind that will carry a vessel from the Humber, will also enable her to leave the port.

If desirous of going to Whitebooth Road, or Hull, you should leave the Burcum buoy on your port or larboard side. The leading-mark along the N.E. side of the Burcum, is Killingholm Church N.W. open to the eastward of Stallingborough malt kiln. In mid-channel are 5 and 9 fathoms. If the wind be scant in the S.W. quarter, keep towards the Burcum Sand, in 5 or 6 fathoms; but when higher up, do not approach nearer to the sand than 8 or 7 fathoms: and as you draw near to Stallingborough Flats, which are steep, and extend about $\frac{3}{4}$ of a mile from the shore, edge over towards the white buoy of the Foulholm, until Inmingham Church bears W. $\frac{1}{2}$ N., when you will be about $\frac{1}{2}$ a mile to the southward of the white buoy. Be careful to go to the westward of this buoy; for the flood-tides set strong upon this dangerous sand. Opposite the buoys, and in mid-channel, are 9 and 10 fathoms. If you are caught in this bight with a flood-tide, or little wind, and cannot get round to the southward of it, you must immediately come to an anchor. In mid-channel, a little below the white Foulholm buoy, are 10 and 12 fathoms. When you are abreast of this buoy, steer N.W., until you bring Grimsby Church on with Stallingborough kiln: then run with this mark on past the new chequered buoy, steering N. by W. $\frac{1}{4}$ W. for Whitebooth Road. But since the lighthouses at Killingholm (described in page 50) have been built, the leading-mark through the best water up the Humber, from the Spurn, is the upper and lower lights in a line, bearing N.W. $\frac{1}{4}$ N., until Grimsby Church is in one with Stallingborough kiln. In turning to windward, you may open the church about a ship's length of the kiln upon each tack. There is good anchorage in this road, with 5 and 6 fathoms water, bringing Patrington steeple on with a tuft of trees, called Salt Rush; and Grimsby Church a sail's breadth open to the eastward of Stallingborough kiln. There is a small tide-light exhibited at Stallingborough, serving to point out the situation of the ferry.

If you wish to proceed to Hull without anchoring in Whitebooth Road, then run on with Grimsby Church just open to the eastward of the kiln, until you get the town of Paull open to the westward of Paull cliff, which will lead along the edge of the sand, all the way to Paull Road, in 4 to $5\frac{1}{2}$ fathoms. When the light at Paull is seen, alter your course to the northward; but do not steer direct for it, until the high light at Killingholm bears S.S.W.; at the same time, pay strict attention to the state of the tide.

A long *flat* extends from the west shore, a little above Whitebooth Road, almost half-way over the river, on which are only 10 or 15 feet. You should let the water flow about an hour before you weigh in the road to proceed upwards. In Whitebooth Road, when you have got under weigh, run over to the eastward, until you open the street of Paull Town, which is the leading-mark to Paull cliff. Then steer up the channel N. by E. and north, in 4, 5, and 6 fathoms. Abreast of the cliff you will have 7 fathoms. A little above the cliff, and close in-shore, is Paull Road and Hedon Haven; the entrance to the latter is pointed out by a dolphin; but the hardness of the ground, and the rapidity of the tides, make these the worst roads in the Humber.

From Paull Road steer N.W. by N. and N.W., round Skitter Sand. Take care to keep Marfleet Church a large ship's length open to the eastward of Marfleet jetty, until Paull jetty comes on with the southernmost house of Paull Town. Then steer with this last mark on, until Marfleet Church and jetty come in a line with each other: the windmill which stands near the lime-kilns will then appear just open of the jetty at the west end of the town, this being the leading-mark up to Hull Road. In this passage, from Paull to Hull Road, you will seldom have less than 6 fathoms water.

On the north side, all the way from Paull to Hull Citadel, are *flats*, which extend to a considerable distance from the shore, with 7 or 8 fathoms close to them. On the opposite side, if in 5 or 6 fathoms, you will be very near to the Skitter Sand, the edge of which is pointed out by four black buoys (already noticed); and should you have a contrary wind, be particularly careful to avoid coming very near this sand, until you are beyond the point; because your getting aground below the point of the sand, may oblige you to grind over it, and perhaps occasion your oversetting. But after you have got round the point of Skitter Sand, you may stand towards it, in 6 or 5 fathoms; and when standing towards the flats on the north side, which are very steep, you must not come any nearer than 8 fathoms; for as the tide, both flood and ebb, sets strong upon them, it is with difficulty that ships, which happen to ground there, can be got afloat.

again. A white buoy (as already noticed) lies on the Hebbles, in $4\frac{1}{2}$ fathoms, half-ebb, neap-tides.

HULL ROAD.—In Hull Road the proper anchorages are, either a little below, or abreast of the Citadel, in 4, 5, or 6 fathoms, to the northward of the chequered buoys on the Middle. The nearer you lie to the shore, you will have the better ground and less tide. If you intend going into the harbour, or docks, you should, if the tide be flowing, run on shore at the Dolphin Point, and get ready for warping in.

Mariners not acquainted with the navigation of this river, should take a pilot from the Spurn, or Grimsby Road; for the rapidity of the tides renders it extremely dangerous; and should their vessel touch upon any of the sands we have described, particularly the Foulholm, Paull Sand, or Skitter, they would very probably be upset, and become an immediate wreck.

TIDES.—It is high water, full and change, at the Spurn, at 20 minutes after 5 o'clock; but the flood-stream runs until half after 5. It is low water at 40 minutes after 11; and the ebb-stream runs until 12 o'clock. On the Sandhaile, and at Grimsby, it is high water at 6. In Hull Road, the time of high water is 6h. p.m.; but the flood-stream runs until a quarter after 6. It is low water at 20 minutes after 12; but the ebb runs until 40 minutes after 12.

At the Spurn Point spring-tides rise 23 feet, neaps about 14 feet: at Hull, springs 22 feet, neaps 13 feet. The variation in the Humber is about $2\frac{1}{2}$ points west. The flood runs across the mouth of the river, $\frac{3}{4}$ of an hour before it turns inward, and then sets across, towards the Lincolnshire shore, W.S.W. Between the Spurn and Clea Ness it sets N.W., the ebb being contrary. Round the Spurn and through the Hawk, and across Trinity Sands, the flood sets N. by W.; while the ebb-tide makes down the Hawk, long before it becomes high water on the shore. Between the Bull and Clea Ness Sand the flood sets northward, and ebb southward; and both ebb and flood set strongly across the Foulholm and Skitter Sands. These are the general direction of the tides within the Humber; and ought, for the safety of the mariner, always to be paid the strictest attention to.

FROM THE HUMBER TO FLAMBOROUGH HEAD AND SCARBOROUGH.

IN sailing out of the Humber, the mariner must refer to the marks and directions already given for entering that river, by which he will readily clear every danger. If in the day-time, and bound to the northward, having passed the light-vessel to the southward, at the distance of a mile or more; or until Dimlington high land comes well open of Kilnsey cliff, bearing N. by W. $\frac{1}{4}$ W., or more westerly, he may pursue a N. $\frac{3}{4}$ E. course to Flamborough Head; but if sailing out by night, it will be proper, when the Spurn lights come N.N.W., to steer E.S.E. or E. by S., taking care not to bring the light-vessel more to the eastward than E. $\frac{1}{4}$ N., until you are well past the light-vessel; you may then shape the above course for Flamborough Head. The distance from the mouth of the Humber to Flamborough Head, is about 11 or 12 leagues. There is deep water everywhere in your passage; and no danger, until you get near the head, from which *rocky ground* runs out 2 or 3 cables' length.

Flamborough Head is a most remarkable object, of great height, and showy whiteness. On it is erected a conspicuous lighthouse, of which we shall have occasion to speak hereafter.

In proceeding along the coast of Yorkshire, there is no danger, until you reach Bridlington Bay. The shore is lined with churches, which may be seen at a considerable distance. The general direction of the land, from Dimlington cliffs to Hornsea, a distance of 6 leagues, is N. $\frac{3}{4}$ W. From thence it turns more northerly, winding gradually to the eastward to Flamborough Head, thus forming a semicircular cavity, named Bridlington, or Burlington Bay.

BRIDLINGTON, or BURLINGTON BAY,* is encumbered with a *sand*, called the *Smithic*; its N.E. end lies a mile S.W. by S. from the point, or extremity of Flamborough Head. It thence takes a S.W. direction for 3 miles, becoming broader as you advance; so that its western part is more than 3 miles in breadth. The shoalest part of the *Smithic* is of a forked shape, with from 10 to 15 feet on it at low water, spring-tides, one of the prongs running W. by S., $3\frac{1}{2}$ miles; and the other S.W., 3 miles. There is an opening between these, a full mile wide, with $3\frac{1}{2}$ and 4 fathoms in it. The shoalest part is near its N.E. point, and has only 10 feet on it. From this spot Flamborough lighthouse bears N.E. $\frac{1}{2}$ N.; and the pier-heads W.N.W., 3 and 1-10 miles. There is another *shoal*, of 12 feet, near its S.W. end: this lies with Owburn bearing W. $\frac{1}{2}$ N., distant $1\frac{1}{2}$ mile; and the pier-head N. $\frac{1}{2}$ E., the same distance. Above a mile to the southward of the *Smithic*, and in-shore of it, is an extensive *flat*, with not more than $3\frac{1}{2}$ and 4 fathoms on it at low water; but to the northward of the *Smithic* there is a channel, which runs from the Head in a W.S.W. direction, with 6 and 7 fathoms in it.

SMITHIC BUOY.—Near the N.E. end of the *Smithic* a red buoy has been moored, in $4\frac{1}{2}$ fathoms, with Bridlington Church bearing N.W. by W. $\frac{1}{2}$ W., and Flamborough lighthouse N.N.E. $\frac{1}{2}$ E.

There is good riding inside the *Smithic*, and a channel each way. The leading-mark to clear the west end of the *Smithic* is, to keep the pier-heads N. by E. $\frac{1}{2}$ E., when between Ouburn and Wilsthorp; or within a mile of the beach: and when Wilsthorp bears W.N.W., you are to the northward of the 12-feet knoll, and may steer more easterly for the anchorage in the bay. To clear the N.E. end of the *Smithic*, bring Gray's farm to the westward of the old tower on Flamborough; but the above-mentioned red buoy will be your best guide.

In running into Bridlington Bay, between the *Smithic* and Flamborough Head, bring Sewerby Hall just open outside the bluff near South Sea, which is a break, or cove, to the southward of Flamborough, until the light comes to bear N.E. by N.; you will then be opposite to the N.E. end of the *Smithic*, and may steer towards the quay for the anchorage.

The riding is good in any part of Bridlington Bay; but the best anchorage is, with Quay Street open, bearing W.N.W., in 4 fathoms water. Within the *Smithic* your soundings will be $3\frac{1}{2}$ and 4 fathoms. The shore is bold and rocky. A red flag is now exhibited in the day-time, upon a staff, 100 feet within the south end of the east pier; and a harbour-light during the night, when there is a depth of 7 feet, or more, at the entrance between the piers.

FLAMBOROUGH LIGHTHOUSE, in latitude $54^{\circ} 7'$ north, longitude $0^{\circ} 5'$ west, is erected on Flamborough Head, 400 yards distant from its extreme point, and close to a bluff point of land on the south side of Silex Cove—the only landing-place near the Head. The light is revolving, having three faces, of seven reflectors each; and in order to distinguish it from Cromer and Tynemouth revolving lights, which show a face every minute, one face appears illuminated every two minutes; of these, the colour of the one is red; and the lights from that face being diminished, will not, in hazy weather, be visible so far as the others; therefore, when in such cases only two faces are seen, the interval of time will be regularly two minutes and four minutes, alternately, which will sufficiently distinguish it from any other light. Cromer light bears from the Flamborough Head light S. $\frac{1}{2}$ E., and is distant between 29 and 30 leagues; the Spurn Head bears S. by W., nearly, distant between 11 and 12 leagues; and the Dudgeon light about S. by E., distant above 21 leagues.

At Flamborough Head the land is very high, and continues so to Speeton Cliffs, being bold-to, and without danger. Your course from outside the Head to Scarborough will be N.N.W., distant 14 miles. At $8\frac{1}{2}$ miles from Flamborough Head is Filey Brig, a bold rocky promontory, advancing into the sea, forming a kind of hook. Behind, or to the southward of this hook, small coasters sometimes ride, sheltered from N.W., but open to all other winds.

Filey Bay is all clean, shoaling gradually to the beach. To clear Filey Brig, keep

* Considerable improvements are in progress at the Bridlington piers; a new north pier, of stone, is completed; and a new south pier, likewise of stone, is in a great state of forwardness, which will, when finished, enlarge the harbour to twice its present size.

Myers' house well open to the south of Hunmanby White Road, bearing S.W. High water, full and change, at 4h. 20m. Springs rise 18 feet, neaps 10 feet.

SCARBOROUGH is a pier harbour, and the vessels, at low water, may lie aground in it. Upon a white tower on Vincent's pier-head, is a tide-light, to be left on the star-board side in entering the harbour. In 1843 the light-tower was raised; the building is now 51 feet high, and shows a red light to seaward and bright towards the harbour. In the day-time a red flag is hoisted while there is 12 feet water at the pier-head, and 10 feet in the harbour. The light is visible, in clear weather, 13 miles.

The best times for going into this harbour are, at half-flood, or after the first quarter ebb; at these times ships may be run aground; the bottom being clean sand. Should the wind, by being northerly at the time of your going in, render it necessary for you to stand over toward the Spa House, you must be careful to avoid the *rocks* that lie out a considerable distance from the shore, to the southward of the Spa, which dry. The swell, coming round the pier-head, when northerly or easterly winds blow strong, causes the ships in the harbour to range very much when they are afloat. At such times it is necessary to moor them with their cables to the dolphins or piers.

Various improvements have lately taken place at Scarborough, and the harbour is now said to be capable of affording shelter, in all gales of wind, to vessels capable of bearing the ground; for in gales from the N.E. they will be safe by running behind the west pier, should they make for the port too early in the tide, which is frequently done; and, in gales from the E.S.E., if they find the old harbour too crowded, they may enter safely into the new harbour, made by the continuation and completion of the outer pier, in which there now are placed both dolphins and mooring rings. Close to, and immediately within shelter of the Adker, there are 15 feet at high water, neap-tides, and 18 in springs. In the entrance of the outer harbour, there is nearly the same depth. The course into both harbours is to the eastward of north.

Scarborough has a good outlet for ships bound to the southward, but bad for those going to the northward. You may anchor in Scarborough Wick; but it is not safe to continue there long. The marks for anchoring are, the castle N.N.W.; the church well open to the southward of the castle; the Spa House west; and Flamborough Head just open of Filey Brig: you will then have about 6 fathoms.

General Description of the TIDES between Cromer and Scarborough.

LEMAN and OWER.—The tide on the eastern sides of the Leman and Ower runs in a variety of directions, as shown in page 34. It is high water, full and change, at 6h. 30m., but the stream runs southward 3 hours longer. Spring-tides rise 13 feet, neaps 8 feet. Here the first of the flood will set N. by E., then turn S.E. for the greater part of the tide, and changes, when near high water, to S. by W., when it runs with its greatest strength in that direction for one hour after, then veers round to the westward, and at low water it runs N. $\frac{1}{2}$ E. in its full force 2 miles an hour.

DUDGEON.—At the Dudgeon it is high water at 6 o'clock, but the stream continues to run till $\frac{1}{2}$ after 7 o'clock, the flood running south and ebb north. Ten miles N.N.W. from the Dudgeon the flood sets S.S.W., and ebb the contrary.

OUTER DOWSING.—On its northern side the tides set variously; thus the first quarter will run S.W. by W., half flood S.E. by S., and near the latter part of the flood E.N.E.; the ebb the contrary.

Between Foulness and Blakeney it is high water, on shore, at $\frac{1}{2}$ after 6 o'clock. Spring-tides rise 20 feet, neaps 13 feet; but with strong northerly winds it will increase to 4 fathoms over the bar. The flood continues to run to the south-eastward until 20 minutes after 9.

In Wells Road it is high water, full and change, at 6h. 20m. Spring-tides rise 18 feet. The flood stream continues to run to the eastward until 9 hours.

Between Wells and Lynn the flood commonly sets along shore to the westward; between Stukeley Overfalls and the north end of the Docking, about W.S.W. and the ebb E.N.E. Here it is high water at 6 o'clock; and spring-tides rise and fall 16 feet, and neaps 10 feet.

Between the north end of the Docking and the south end of the Inner Dowsing, the first of the flood sets S.W., changing to W. by S., until it is high water. Outside the Docking and Dowsing, and near the south part of Race's Bank, spring-tides never slacken, but continue their velocity of $2\frac{1}{2}$ and 3 knots; the first quarter flood sets S.E., the second quarter from S.S.W. to S.W. by W., gradually varying until high water, when it becomes west: while the first quarter ebb sets from W.N.W. to N.N.W., half-ebb about N.N.E. or N.E. by N., then E.N.E., east, and E.S.E., until low water.

In Lynn Well it is high water at 6h. 30m.; spring-tides commonly rising 23 feet, neaps 14 feet: the former running $4\frac{1}{2}$ and 5 knots, the latter $2\frac{1}{2}$ knots.

Off Boston Buoys the flood sets W.S.W., and off the hook of the Long Sand W. by S., the ebb being the reverse way.

Near the north end of the Inner Dowsing the flood sets S.W. by W., between that sand and the shore S.S.W., running until $\frac{1}{2}$ after 5.

At the Spurn Point it is high water, on full and change days, at 20 minutes after 5. In Hull Road at 6. In the Humber, spring-tides rise 20 and 23 feet, neaps 10 to 14 feet. Off the mouth of the Humber, at the distance of 7 or 8 miles, it continues to run till 7, and $\frac{1}{2}$ after 7 o'clock.

In Bridlington Bay it is high water at $\frac{1}{2}$ after 4; spring-tides rising 15 feet, neaps 9. Here the flood sets strongly along shore to the southward, and continues to run until $\frac{1}{2}$ after 7 o'clock. In the offing it runs for 3 hours after high water on the shore, or until it is half ebb there.

At Flamborough Head it is high water at $\frac{1}{2}$ after 4. Spring-tides rise 20 feet, and neaps 11 feet. On the south side, near the Head, the flood sets S.W. by W., and the ebb the contrary; for which reason, vessels bound to the southward, should not pass the Head without the flood in their favour, especially with a scant wind.

At Scarborough it is high water 15 minutes after 4; and spring-tides rise 13 feet, neaps 8 feet. In the offing, the stream runs until 6h. 45m.

FROM SCARBOROUGH TO ST. ABB'S HEAD.

Description of the Coast, &c.

FROM Scarborough the land to the northward is *rocky*, and stretches N. by E. for about 5 miles, to a place called Hairburn Wick; it then winds north, 3 miles, towards the south cheek of Robin Hood's Bay.

ROBIN HOOD'S BAY is a place where vessels may stop a tide, riding under the north cheek of the bay, in 8 or 9 fathoms; but it will not be prudent to remain there long, especially in winter. The south and north cheeks of the bay are *clusters of rocks*, which project into the sea, and consequently must always have a good berth given to them in passing.

WHITBY HARBOUR lies about 7 miles N. by W. $\frac{1}{2}$ W. from the south cheek of Robin Hood's Bay. It is a pier harbour, and ebbs almost dry. In your passage to Whitby, there is a very dangerous *ledge of rocks*, lying to the eastward of the harbour, full $\frac{3}{4}$ of a mile from shore, and having a passage within it 300 yards broad, called the *Sledway*; this *ledge* is called the *Whitby Rock*, and rendered particularly hazardous, on account of the flood setting to the southward directly across the harbour's mouth; it is composed of *hard black rocks*, with large stones lying down to the low water mark; its head bearing from the western pier N.E. by N. $\frac{1}{4}$ E., distant $\frac{3}{4}$ of a mile. A black beacon-buoy is now placed about a cables' length N.E. of the extremity of Whitby Rock, in 10 fathoms, with the white gable end of the Marine Hotel, in line with the north side of the west pier-head. Whitby Road lies between Whitby and Uppang Rocks, which latter bears N.W. $\frac{1}{2}$ W., a mile distant from the former, stretching out from the shore, until its eastern end bears N.N.W. from the western pier, distant $1\frac{1}{2}$ mile. Over Uppang Rock are only 4 and 5 feet water; but in the roadstead are 5, 6,

[NORTH SEA.]

and 7 fathoms. The mark for the anchorage being Larphill House over the middle of Whitby Town, bearing S.S.W.

The town of Whitby is situated at the entrance of the River Esk, and much esteemed for its manufacture of canvas and alum. The harbour is considered the best hereabout, having a fine pier, but no communication with the adjacent country. There is a stone lighthouse erected upon the western pier, in latitude $54^{\circ} 29' 42''$ north, and longitude $0^{\circ} 36' 42''$ west, 83 feet above level of the sea, and 60 feet from the base to the lantern, which exhibits a fixed light while there are 8 feet water over the bar; a flag in the day-time is also shown there during the same period of the tide. In clear weather, this light may be seen about 4 leagues off. The town was formerly noted for its ancient and magnificent abbey, the tower of which was 104 feet high, and supported by 4 lofty pillars, forming a picturesque object to the traveller, and a useful mark to the seaman; but this tower, on Friday the 25th June, 1830, fell to the ground.

If coming from the southward, you must take care to avoid the *Whitby Rock*, by keeping the north cheek of Robin Hood's Bay open of High Whitby, until you bring a remarkable house in the country, called Larphill House, on with the east pier end, bearing S.S.W. $\frac{1}{2}$ W., and with the mark, enter the harbour. Should the boats not venture off to your assistance, if you see a flag hoisted upon the north cliff, you may safely run for the harbour; but if, instead of the flag, you observe a fire in that place, you are to understand, that your attempting to go in would be attended with imminent danger.

You are also particularly to observe, that at spring-tides, when the wind blows hard from between S.S.E. and east, vessels drawing 10 feet may go through the Sledway, if the signal be hoisted to pass the bar; but all vessels drawing more than 10 feet water must haul round the north part of Whitby Rock. The mark for sailing through the Sledway is, the second Nab, on the west side of the harbour, open to the northward of the west pier-head. In losing the flood-tide, so soon as you get within the rock, haul up, until the second pier-head on the eastern side appears a sail's breadth open of the east pier-head, then stand in for the harbour. Instances have occurred, when vessels have been unable to fetch in, on account of giving the rock too wide a berth, this having occasioned their hauling up so much as to get the sea on or before the beam, which, by checking their headway, obliged them to fall to leeward, and go on shore. At high water the sea appears all broken between the rock and the main; and whenever this occurs with easterly winds, there will be but little tide to the southward.

Sand's End is a bay or roadstead, where vessels with southerly winds may ride safely, in from 8 to 4 fathoms water. It lies N.W. by W., about 2 miles from Whitby Rock; having Uppang Rock half-way between them. A mark for Sand's End Road to the westward is, the middle of Sand's End town and Mulgrave Castle in one, bearing W. by S. $\frac{1}{2}$ S. Between Whitby and Lyth, which latter is a small town, distant from the former about 3 miles, and lying to the north-westward, is a *level sand*, usually called *Whitby Sand*, and occasionally forming a race ground.

RUNSWICK BAY.—About 5 miles N.W. by N. from Whitby, is Runswick Bay, capable of containing about 18 sail of shipping, in 5 and 6 fathoms water; it is clear of rocks, and forms a good retreat for vessels in gales of wind, but too open to the northward; the mark for running in is, Brown's Hill, kept on with the limekiln on the west side, until the cliff, on which it stands, shuts in the high land behind; you will then be in $4\frac{1}{2}$ fathoms, clayey ground.

When you are to the northward of Runswick Bay, and between it and the *Tees*; bring the ruins of Whitby Abbey open of Kettleness, and this will clear the land all the way.

About 4 leagues N.W. from Whitby is Hunt Cliff. The coast between is irregular and rocky; your courses, therefore, from Whitby, will be N.N.W., 7 miles, and then about N.W. by W., 6 miles. From Hunt Cliff, Hartlepool bears N.N.W. $\frac{1}{2}$ W., distant nearly $3\frac{1}{2}$ leagues; and to Souter Point N. $\frac{1}{2}$ W., 9 leagues. Between Hunt Cliff and Hartlepool lies the entrance to the River Tees. In your passage from Hunt Cliff lie the *Salt Scars*, which are extremely dangerous; and to the southward of these, are some *rocky spots*, of only 2 fathoms water; of these the outer one is called the *High Rock*, lying nearly in a line between the outer part of the Salt Scars and Hunt Cliff, or 3 miles N.W. by N. $\frac{1}{2}$ N. from the latter.

The **SALT SCARS** are two or three narrow ridges of rocks, extending from abreast of Redcar Point, to the eastward, above $1\frac{1}{2}$ mile; they dry at half ebb, a mile N.E. from Redcar. These rocks should never be approached nearer than 10 or 9 fathoms. Some vessels have been wrecked upon them in consequence of mistaking the west end of Barnaby Moor for Hunt Cliff Foot, and by not getting a cast of the lead in time. To prevent such mistakes in future, observe that Hunt Cliff Foot is almost perpendicular, while Barnaby Moor slopes to the westward, and upon it stands Captain Cook's tower. At night the low land cannot be seen, and this occasions the error; the mariner will do well, therefore, to attend to his soundings. You may anchor before the mouth of the Tees, in 8, 9, or 10 fathoms, fine brown sand, the ground clean, and holding tolerably well.

RIVER TEES.—The channel into this river is between the North and South Gare, running in from the bar nearly S.W. by S., for 3 miles; it then turns circularly round for about $2\frac{1}{2}$ miles, when it resumes a north-westerly course again, this part being bounded by the Seal Sand. Its channel is marked by several beacons and buoys; of which the following is a description, as they were lately situated; but they are liable to be occasionally altered, in conformity to the shifting of the sands.

The first, or fairway buoy, is red, and has a staff and vane upon it, lying in 5 fathoms, on the outside of the bar, about $\frac{1}{2}$ a mile distant from the red bar buoy, which lies on the edge of the bar, and marks the deepest water, being about 8 feet with a low ebb.

The first buoy on the port or larboard hand within the bar, is white; this is situated on the edge of the South Gare. On the opposite side to this is the first black buoy, lying on the North Gare, and to be left to the starboard; the next also, on the western side, is a black buoy, and lies upon the elbow of the North Gare, to be left to the starboard; there is also a third and fourth black buoy, the latter situated at the western end of the Middle Knoll, or Scalp, which must be left to the starboard: all these black buoys are placed at the edge of the North Gare. The South Gare has also three white buoys: and on the elbow of the Bran Sand is a fourth white buoy: all of these must be left on the port or larboard side in entering.

S.W. $\frac{1}{2}$ S., nearly $\frac{1}{2}$ a mile from the white buoy of the Bran, is the fifth black buoy; this lies at the entrance of an inlet running towards Snook Point; and between these a light-vessel has lately been placed. South from the fifth black buoy, distant about $\frac{1}{2}$ of a mile, is the sixth black buoy, and farther on are two others, all of which must be left to the starboard in sailing up to Stockton. Two of these buoys lie near Stoney Brig Reef, the one above, the other below, which may be considered as the inner bar of the harbour, over which you cannot proceed without a flood-tide, there being only 4 feet, mid-channel.

In addition to these buoys, there are two stone beacons, with triangular heads, which, when brought in one, lead over the channel off the Stoney Brig. Above this, on the western side of the channel, is the Dagger's beacon, with a square head, standing singly; $\frac{1}{2}$ a mile beyond which, on the same side, is the Middle beacon, from whence the river winds up to Stockton; but for the River Tees it will always be necessary to have a pilot.

A pilot for the Tees may always be readily obtained by hoisting a flag at your fore-top-mast-head between half-flood and half-ebb; the rate of pilotage being from the 1st of April to the 1st of October, 15*d.* per foot, and from the 1st of October to the 1st of April, 18*d.* per foot.

If you are bound into the River Tees from the southward, steer from Hunt Cliff N.N.W. $\frac{1}{2}$ W. with the flood, and N.W. by N. with an ebb tide; this will clear you of the Salt Scars, towards which approach no nearer than 9 fathoms. The leading-mark is, Elwick beacon (a small round hill on the southernmost extremity of the high land in Durham), in one with a high house in the north part of Seaton, bearing N.W. $\frac{1}{2}$ W.; and when the west end of Barnaby Moor bears S.W., you will have passed that reef.

If bound into the Tees from the northward, and being abreast of Hartlepool, with the wind at N.W., or more northerly, steer in so as to bring the Earl of Darlington's House, (which is white, with a flat blue slated roof, and stands near to the westward of the Church of Hartlepool), just touching the steeple end of the church, bearing about N. $\frac{1}{2}$ W., and it will carry you to the bar of the Tees.

If, with a northerly wind, you come from the northward for the Tees, keep in 5 and 6 fathoms, which will clear the *Long Scars*, a rocky ridge, lying nearly a mile to the southward of Hartlepool, and extending nearly east and west, full $\frac{1}{2}$ of a mile from the shore; it dries at last quarter ebb, and must always be carefully avoided. To clear the Long Scars, which has a black buoy on its extremity, bearing S. $\frac{1}{2}$ E. from Hartlepool lighthouse, bring a high sand-hill, situated to the northward of Hartlepool, over the chapel at the west end of the town; the thwart mark is, Car blue-tailed house W. by S. $\frac{1}{2}$ S. Keeping the chimnies open either way, will clear it.

The following notice has been issued from the office of the Tees Navigation Company, dated 12th April, 1839:—

"The Tees Navigation Company have caused lighthouses to be erected near the entrance of, and a light-vessel to be moored within, the River Tees, from which lights will be exhibited on the 2nd day of May next, and thenceforward continued from sunset to sunrise, in order that the Tees bar may be rendered navigable, and anchorage obtained within the bar by night, in favourable weather. The particulars and contemplated application of these lights are hereafter described. Two towers have been erected a short distance northward of Seaton Carew, being situate from each other north $52^{\circ} 15'$ west, and south $52^{\circ} 15'$ east, distant 3550 feet; from the high, or north-western, of which, a bright fixed light, and from the low, or south-eastern, of which, a stationary red light will be displayed; the former burning at an elevation of 85 feet, and the latter at 30 feet above the level of the sea at high water, spring-tides. Upon the Bran Sand two towers have also been established, which stand from each other south $29^{\circ} 30'$ west, and north $29^{\circ} 30'$ east, distant 3251 feet, from the high, or southern, of which, a fixed bright light, and from the low, or outer, a red stationary light will be exhibited, the high burning 48 feet, and the low 35 feet, above the sea, at high water level of spring-tides. And a light-vessel has been moored near where the 5th buoy has hitherto laid, from which a bright light will be seen in all directions. In approaching the River Tees from the southward, masters of vessels must take care to run in with the lights near Seaton in a line, bearing N.W. $\frac{1}{4}$ W., (that direction affording a safe offing off the Salt Scar Rocks,) until the lights upon the Bran Sand are brought into line bearing S.S.W. $\frac{1}{4}$ W., when they will have arrived at the fairway buoy; then steer to the southward, with the Bran Sand lights on with each other, until the floating light shall bear S.W. $\frac{1}{4}$ W., when that course may be steered up the river, observing that anchorage must be taken up to the southward of the floating light-vessel, and care taken not to foul her moorings, or fall into collision with her. To cross Tees bar from the northward, the lights upon the Bran Sand will first be available, the Seaton lights, in a line, serving to mark an arrival at the fairway buoy, when the foregoing directions will be applicable. In departing from the River Tees, these directions will of course be used in a reversed order, the bearings given being all magnetic. It is necessary to notice, that the light towers upon Bran Sand will from time to time be adjusted, in conformity with any changes which may take place in the entrance of the Tees, and, therefore, the mariner, in navigating therein, must direct his attention to keep these lights on with each other, without paying entire regard to the bearing of them, as published herein."*

HARTLEPOOL is situated on a promontory nearly surrounded by the sea. The church stands in latitude $54^{\circ} 41' 8''$ north, and longitude $1^{\circ} 10' 7''$ west. The harbour is small, but recently has been greatly improved, by a pier, flood-gates, &c., so that small vessels may now run in there, and be securely sheltered.†

On the pier-head is a lighthouse, from which is exhibited a red light; and ships coming from the northward will open this light when it bears N.N.W., and should not, in

* The Company have caused a careful survey of the River Tees to be made, and a correct chart to be published, upon a large scale, which may be had of Mr. T. Jennett, Stockton, and of his agents at the different sea-ports.

† *Proposed Lighthouse on Hartlepool Heugh.*—The merchants, owners, and masters of vessels interested in the trade of Hartlepool, having sent a memorial to the Trinity Board, soliciting that a lighthouse may be established on the Heugh at that place, the Elder Brethren are ready to take the necessary measures for erecting such lighthouse, and maintaining a light thereon during the night season; provided, the trade of the port consent so pay such toll on all vessels entering the port or departing therefrom, as shall be requisite to defray the expense of such lighthouse and light. This the trade of the port are willing to do, &c. &c.—January, 7th, 1845.

the night-time, approach nearer the shore than 6 or 7 fathoms water, at high tide, and when the light bears N.N.W., they may anchor, if necessary. In proceeding for the harbour by day, they must, after passing the chequered buoy, leave all the black buoys on the starboard side.

In the day-time, a red flag will be hoisted at half-flood, and continue to half-ebb.

From the lighthouse, the outer part of Hartlepool Heugh bears E.S.E., $\frac{1}{2}$ of a mile; the Long Scar buoy S. $\frac{1}{2}$ E., 1 and 1-10th mile; the chequered buoy of the bar S.S.W. $\frac{1}{2}$ W., about 120 fathoms; the Tees fairway buoy S. by E., 2 and 4-10ths miles; and the Red, or Roe cliff, S.E. by S., 14 miles.

In addition to the above-mentioned red light, a tide-light, of a white colour, has been exhibited immediately below it, which is lighted from half-flood to half-ebb. Two red lights have also been placed upon the dock walls, as a further direction: and in running for the harbour, when the pier-light bears N.N.E. $\frac{1}{2}$ E., about 120 fathoms, vessels must steer in a N. $\frac{1}{2}$ E. direction, until the two lights are brought in a line, bearing N. by W. $\frac{1}{2}$ W., which is the direct course up the channel to the entrance of the inner harbour.

If you are bound to Hartlepool with a north or N.W. wind, you should give the Heugh a good berth, until Hart mill comes over Hartlepool Pier. This mark will clear the Stone Reef, which runs out to the southward of Hartlepool; then bring Stranton Church over Row Houses; run in with this mark, until the third house from the Heugh, called the Field House, comes open of the east end of the Church; then anchor, in 4 or 5 fathoms, on a bottom of clay. This roadstead is good with N.W. winds. If bound for the harbour, hoist a jack, and you will immediately obtain a pilot. There are 8 and 9 feet at high water, neap-tides.

Sunderland Harbour lies about 5 leagues N. $\frac{1}{2}$ E. from Hartlepool, the coast bending inward between them. There is a *knoll*, called the *Boat*, lying nearly N. by W. from Hartlepool Point, distant about $5\frac{1}{2}$ miles.

SEAHAM.—This place is now rising into consequence; and a new harbour, with two piers, is forming there, with the intent of being able to afford accommodation for the shipping of coals therefrom. It is situated between 9 and 10 miles to the northward of Hartlepool, and 5 miles S. by W. $\frac{1}{2}$ W. from the entrance to Sunderland. About $\frac{1}{2}$ a mile S.S.E. from Seaham Harbour, is a *shoal*, of 9 feet; and within it, in the same direction, or two other *knolls*, or *scars*, on which buoys are placed.

A new lighthouse has been built at Seaham, first lighted in December, 1844. It is lighted with brilliant gas, the top lantern showing a constant bright light, 100 feet above the mean level of the sea. The lower lantern is a red revolving light, $\frac{1}{2}$ a minute visible and $\frac{1}{2}$ a minute invisible, at all points where the top light is seen. It is 54 feet above the level of the sea. This light will be easily distinguished from all other lights on this part of the coast.

In January, 1845, a new dock was opened at Seaham, named the New North Dock. This dock was constructed in the short space of 12 months.

SUNDERLAND is now considerably improved, having two excellent piers, upon each of which is a lighthouse. The northern is 64 feet high, and the southern 23 feet, the lanterns being 73 and 32 feet above the level of high water. Both are fixed lights, and may be seen from 3 to 6 leagues off. The northern light is lighted during the whole night; but the southern from half-flood to a quarter-ebb only, or while the wind and tide are favourable for entering the harbour; and, with a westerly wind, it is put out at high water. In the day-time a flag is hoisted during the same period of tide.

The lighthouse on the northern pier has been removed to the east end thereof, and now exhibits, in addition to the bright light 64 feet high, a red-coloured light, 18 feet below the former, both being exhibited from sun-set to sun-rise.

There is a *patch*, called the *White Stones*, having only $1\frac{1}{2}$ fathom on it, lying $\frac{3}{4}$ of a mile S. by W. from the Hendon Rocks, having 5 and 6 fathoms within it.

From Sunderland lighthouses, Suter Point bears N.E. by N.; the outer end of Whitburn Rocks N.E. $\frac{1}{2}$ N.; the north buoy of the Roads N.E. by E.; the south buoy of the Roads E.S.E.; the outer end of the South Rocks S.S.E.; and the outer part of Hendon Rocks S.S.E. $\frac{1}{2}$ E.

The buoys in the Roads are laid in $5\frac{1}{2}$ fathoms, and a beacon is erected upon the ex-

tremity of the rocks. Persons unacquainted with this part, may always depend upon a boat putting off to them, if the weather will permit.

TYNEMOUTH.—About 3 miles N.E. by N. from Sunderland, is Suter Point; and $3\frac{1}{2}$ miles N. by W. from Suter Point, is Tynemouth Haven. This place is easily known in the day-time, by a castle, in ruins, which stands on the northern side; and in the night-time, by a revolving light, which is constantly kept there, exhibiting a light in its brightest state once every minute, like a star of the first magnitude; but gradually declining, and becoming less luminous, until it is quite eclipsed. The lighthouse is built of stone, in the castle yard, 62 feet high, and its lantern elevated 148 feet above the level of the sea, and may be seen 6 leagues off.*

In proceeding along shore from Sunderland to Tynemouth, you should give the land a good berth, for it is generally rocky. On that side, just without, and opposite to the little inlet, called Prior's Haven, is the *Sparrow Hawk*, a most dangerous rock; and at the south side of the entrance to the haven, is a large sand, called the *Herd*.

On the 28th of April, 1842, a yellow buoy was laid down at the entrance of Shields Harbour, close to the N.E. point of the Herd Sand, in $7\frac{1}{2}$ feet at low water, spring-tides, with Tynemouth lighthouse N. $\frac{3}{4}$ W.; the high light at North Shields W. by N. $\frac{3}{4}$ N.; and the above high lighthouse 2 sails' breadth open of the low lighthouse.

Within the river, and near the town of North Shields, are two lighthouses, which lead over the bar, and close to the Herd Sand, in the deepest water; and when coming from the northward, there are 2 beacons erected on the Law, which, brought in one, with a northerly wind, will carry you close to windward, until the lights come on with each other. These lighthouses are white, the highest being in front of Dockwray Square, and the lower near Clifford's Fort, bearing from each other W. $\frac{1}{2}$ N. and E. $\frac{1}{2}$ S., distant 720 feet. They exhibit bright fixed lights, of 123 and 77 feet respectively above the level of high water, and may be seen from 5 to 6 leagues off. The upper tower is 49, and the lower 76 feet high. The lights appear only from a quarter flood to a quarter ebb; and a flag is hoisted, in the day-time, during the same period of tide. On the bar, at the lowest ebbs, are 7 or 8 feet water.

There are three warping-buoys within the river: two on the south, and one on the north side; and a buoy outside of Clifford's Fort, where the low light is situated. A post is placed on the south side, near the town of South Shields, bearing a flag at tide-time, to denote when vessels may go over the bar. Within the bar, you will have from 10 to 17 feet, the greatest depth being near the northern side as you enter, until you reach the first warping-buoy on the north side; then haul over S.W. to the second buoy, keeping mid-channel, and your depth will again increase from 12 to 23 feet towards the town of Shields. No vessels are here permitted to wait above a tide, if the weather will allow them to put to sea; and strong northerly winds will always increase the depth of water over the bar, while strong southerly gales will decrease it. There is anchorage off Tynemouth Castle, the light bearing W. by N., in 7, 8, and 9 fathoms. In settled weather, it is high water, full and change, about 3 o'clock upon the bar. Northerly winds may make it so an hour sooner, and southerly winds an hour later. When masters of vessels pay their port dues, they commonly receive, with the receipt, a copy of the regulations, and a plan of the harbour.

The awkward sand, known by the name of the *In-sand*, at Shields, has entirely disappeared. It was a great impediment to the navigation.—*Tyne Mercury*, March 19th, 1845.

BLYTHER.—About 11 miles N. by E. from Tynemouth Castle, is Newbigger Point. Between them lie Hartley and Blythe, two small harbours, where ships load coals and salt; and these, at low water, are dry. Off Blythe are some rocks, called the *Sow and Pigs*, which appear at the last quarter ebb; by keeping Tynemouth Castle open of, or without Hartley Bates, you will go clear of them. The *Bates* is a rocky

* The Collingwood Monument, now erecting at the entrance of the Tyne, a little to the west of the Spanish Battery, will form a conspicuous land-mark for seamen, easily distinguished from all others. In consideration of this circumstance, a subscription of 100 guineas has been made by the Trinity House of London. The height of the erection, including Mr. Lowe's statue (21 feet high), will be 80, 90, or 100 feet, just as the countrymen of Collingwood, and more especially his townsmen, may decide. The Duke of Northumberland, already a liberal subscriber, has promised an additional piece of ground, for pleasure purposes, if the funds be subscribed for its enclosure.—*Durham Advertiser*.

point, or *ridge*, which extends out a considerable way from the shore to the southward of Hartley Harbour. There are also three other *rocks*, lying near the land, to the northward of the Bates, called the *Outer Bell Rock*, *Inner Bell Rock*, and *Colville Rock*. This part is usually called Seaton Road.

At Blythe Harbour, near the south end of the town, there is a bright fixed light, placed on the port or larboard side of the entrance, which is always exhibited when there are 8 feet water over the bar, and is visible at the distance of 3 leagues, according to the state of the weather; in the day-time, a flag is hoisted instead, at the same period of the tide.

Off Newbiggen Point the *rocks* extend nearly $\frac{1}{2}$ a mile from the land; and off Cresswell the *foul ground* runs out full $\frac{1}{2}$ of a mile from the shore. The *Cresswell Sheres* are two *rocks*, with only 3 fathoms on them, with 12 to 15 fathoms close to on the eastern side, and from 7 to 8 just within them. They lie $1\frac{1}{2}$ mile from the shore. Ratcheugh Crag, over the highest part of Hauxley trees, bearing N. $\frac{1}{4}$ E., leads directly on them. The thwart mark for the southernmost rock is Cresswell Hall W. by S., $1\frac{1}{2}$ mile; and for the northernmost one the same building S.W. by W. $\frac{1}{4}$ W., nearly 2 miles.

N. by E., distant $2\frac{1}{2}$ miles from the North Cresswell Skere, lies the *White Bank*, with $2\frac{1}{2}$ fathoms upon it; and N.E., $\frac{1}{4}$ of a mile from the latter, lies the *Northern Hill*, with $2\frac{1}{2}$ fathoms on it, having a passage between them, with 4 fathoms in it. These two patches lie a mile from the land. The mark to clear them to the eastward is, Dunstanburg Castle N. by E., open east of Coquet Island. This mark will also carry you clear to the eastward of Bondicar and Hauxley Rocks.

COQUET ISLAND (in latitude $55^{\circ} 20'$ north, and longitude $1^{\circ} 32'$ west) is a small rocky island, about $\frac{3}{4}$ of a mile distant from the main; about $8\frac{1}{2}$ miles N. by E. $\frac{1}{4}$ E. from Newbiggen Point; and nearly 20 miles N. by E. from Tynemouth lights. Within there is good anchorage; but it will be always more safe for vessels to go round the north end of the island to this anchorage, than between the island and the main, being less intricate.

Every navigator frequenting this most dangerous part of the coast, in thick weather, should keep the lead constantly going; for the influence of the tides over your vessel is here excessive, and the neglect of the lead has been the destruction of numerous ships and lives.

COQUET ISLAND LIGHTHOUSE exhibits a bright fixed light, of great power. It is visible from N. by E. $\frac{1}{4}$ E. to S. by W. $\frac{1}{4}$ W. A light, of inferior power, is also shown landward in all directions, and was first lighted October 1st, 1841. The lantern is 80 feet above high water mark.

Buoys of direction, for the anchorage within the said island, have also been placed in the undermentioned situations, and with the following marks and bearings:—

A red beacon-buoy, marked "N.E. Coquet," in $5\frac{1}{2}$ fathoms water, with the south end of Morwick trees in line with the house on Amble Point, bearing W. by N.; a slated-roofed house, at Bondicar, in line with Hauxley Point, S.W. $\frac{1}{4}$ S.; and Coquet lighthouse S.S.W. $\frac{1}{2}$ W.

A red-and-white buoy, painted in circles, marked, "N.W. Coquet," in 2 fathoms, with the southernmost of two clumps of trees, on the south land, its apparent width on Bondicar Point, bearing S.W. by S.; the west end of a long wood in line with the east end of the sand-hills, next west of Alnmouth, N. by W. $\frac{1}{4}$ W.; N.E. Coquet buoy E.N.E.; and Coquet lighthouse S. $\frac{1}{4}$ E.

A red buoy, marked "S.W. Coquet," in 3 fathoms, with the east end of Shilbottle trees in line with the tower of Warkworth Castle, bearing N.W. $\frac{1}{4}$ W.; a cluster of trees inland, apparently midway between two houses, at Bondicar, one having a red-tiled, and the other a slated roof, S.W.; and Hauxley Point buoy S. $\frac{1}{4}$ E.

A black buoy, marked "Sand Spit," in 9 feet, upon the extremity of a reef, running from the main land towards the islands, with the west end of Warkworth Castle in line with Amble Point, N.W.; Bondicar Point in line with the southernmost of two clumps of trees to the southward, S.W. by S.; and Hauxley Point buoy S. by E. $\frac{1}{4}$ E.

A black beacon-buoy, marked "Hauxley Point," in $5\frac{1}{2}$ fathoms, on the extremity of this dangerous reef, with a farm-house, having a lofty chimney on its west end, in line with the house on Amble Point, N.N.W. $\frac{3}{4}$ W.; Earsden windmill in line with a slated-roofed house, at Bondicar, W. by S. $\frac{1}{4}$ S.; and Coquet lighthouse N. $\frac{1}{4}$ E.

A black-and-white chequered buoy, marked "Pan Bush," in 2 fathoms, on the S.E. part of the shoal so called, with the south part of Morwick trees in line with the north end of Gloster Hill, W. $\frac{1}{2}$ N.; a red-tiled house, within the sand-hills its apparent width open north of Radcliff Colliery chimney, bearing S.W. $\frac{1}{2}$ S.; Coquet lighthouse S.S.E.; and N.E. Coquet buoy S.E. by E. $\frac{1}{2}$ E.

Mariners are to observe, that the safest approach to this anchorage is north of the island, between the N.E. Coquet and Pan Bush buoys, there being only 8 feet water in the south entrance, viz.:—between the S.W. Coquet and Sand Spit buoys.—*Trinity House, London, September 3rd, 1841.*

Directions for Coquet Island and Roads; by MR. JOHN MUERS, Harbour Master, Warkworth.

THIS island is a little more than 400 yards long, and about half that distance in breadth: this only includes the sward, or grass part. *Reefs of rocks* stretch out from all parts. The east side is steepest. From its north end, the reef stretches in a N.N.E. direction, a little more than 400 yards from high water mark, or sward part of the island, the reef being in length about the same as the sward. The most projecting shoals are marked out by buoys, laid down by the Trinity House of London. In the entrance of the north channel is a red beacon-buoy, marked "N.E. Coquet," in 5 $\frac{1}{2}$ fathoms; this buoy lies on the north end of the reef running from the island, and bears from the Coquet lighthouse N.N.E. $\frac{1}{2}$ E. A red-and-white buoy, painted in circles, marked "N.W. Coquet," in 2 fathoms; this buoy bears W.S.W. from the beacon-buoy, about 3 cables' length, and bears from the Coquet lighthouse N. $\frac{1}{2}$ W. After passing the last-mentioned buoy, steering in a S.W. direction, until the Coquet lighthouse bears from S.E. to S.E. by E., is the anchorage. Observe, that both these buoys must be left on the port or larboard side in taking the roadstead. In going in on your starboard side, at about $\frac{1}{2}$ a mile N.W. from the N.W. Coquet buoy, is the Pan Bush buoy, in 2 fathoms, chequered black-and-white, and lies on the east side of that shoal. This reef stretches in a N.N.E. and S.S.W. direction, a little more than a cable's length on each side, in those directions from the buoy, and has only 5 feet water on its shoalest part, near and to the west of the buoy: these marking out the north channel into the roads, which is the broadest, and has the deepest water. To the N.W. of the beacon, or North Steel buoy, there are some *rocky patches*, but none with less than 4 fathoms upon them; and with heavy gales the sea breaks on them at low water. The marks for running in, should the buoys be removed from their proper situations, are, the south end of Morwick trees on with a house standing on a point at the south entrance to Warkworth Harbour. These trees are about 2 miles from the coast; but by bringing any part of Amble village in sight open to the north of the same point, will clear the North Steel, bearing about W. $\frac{3}{4}$ N.

In taking the roads (the south channel), a black beacon-buoy lies in 5 $\frac{1}{2}$ fathoms, marked "Hauxley Point," on the extremity of the reef: from this it may be called the south extreme, and bears from Coquet lighthouse S. $\frac{1}{4}$ W., about $\frac{3}{4}$ of a mile. N. $\frac{1}{4}$ W., and nearly the same distance from the beacon-buoy, is a red buoy, in 3 fathoms, marked "S.W. Coquet," and must be left on the starboard side. Between the beacon-buoy and the S.W. Coquet, there are 6, 7, 5, 4, and 3 fathoms towards the latter. From the last-mentioned S.W. Coquet buoy, in a N.W. $\frac{1}{2}$ W. direction, a little more than a cable's length distant, lies a black buoy, marked "Sand Spit," in 9 feet, and must be left on the port or larboard side. Between these two last-mentioned buoys, is the shoalest part of the channel, there being little more than 8 feet. After passing the Sand Spit, which is *rocky*, the lighthouse will then bear E. by N.; steer north, until the lighthouse bears S.E. by E. or S.E., which is the best anchorage, in from 3 to 4 fathoms. Should any of the buoys be from their proper situations, the marks for running in are, the south part of Warkworth Castle open to the north of the bluff point, on the south entrance of Warkworth Harbour, on which a house stands, as before mentioned, for the north channel. The south channel should only be taken by vessels of light draught of water, and when smooth at low water. In stormy weather, should it blow strong from S. to S.E., the south channel might be taken, avoiding low water.

You ought to wait till sufficient rise of tide, according to your draught of water and send of the sea. With the wind at E.S.E. to east, it is advisable to take the north passage; but only in a case of emergency take the roads with the wind to the north of east. When coming to anchor in the roads, a good scope of cable should be given; as by hanging a vessel up short, and once starting her anchor, there is little room to drive; and, moreover, the ground being strong clay, the anchor is apt to get shod, and prevent its taking hold again.

In approaching the island from the south, with the wind from the west or W.N.W., it is advisable to reach down to the east and north of the island, and ply to windward, until north of the Pan Bush buoy. From $\frac{1}{4}$ to $1\frac{1}{2}$ mile north of the buoy, is good anchorage with off-shore winds. The same may be observed with vessels from the north; as Coquet Roads should not be taken with the wind any way north of either east or west.

Vessels taking the roads (the north channel), with the wind at S.E., ought not to be slack of canvass, on account of fetching up into the roadstead. In approaching the light at night-time, from the southward, and before getting within a mile, it should be brought to bear N. by W.; as in steering a course N. by E. from Newbigen Point, and direct for the light, will run inside of the Hauxley Head buoy, and upon that dangerous reef.

TIDES.—The tides in the south channel, for the first half-flood, set in the direction of the channel; but after that, and until an hour after high water on shore, it sets more southerly towards Hauxley Rocks. The ebb-tide sets fair.

On the first rise of the tide on the shore, it sets S.E., round the North Steel, and for about $1\frac{1}{2}$ hour joins the ebb on the east side of the Coquet. The strength of the tide is about $\frac{1}{2}$ a mile an hour on neaps, and $1\frac{1}{2}$ on springs. The cause of the flood-tide setting round the North Steel to the S.E., may be accounted for; the deep bay from Bulmer to Aln-Mouth, and first of the flood along the shore, meeting the narrow channel, formed by the S.W. point of the Coquet Island and Hauxley Rocks.

The bearings and courses are magnetic; and soundings, at ordinary spring-tides, of low water.

ALN-MOUTH.—About 4 miles N.N.W. from Coquet Island, is the entrance to the River Aln, leading to Alnwick, where small vessels generally take in corn. From hence to North Sunderland Point, the coast is encumbered with *rocks* and irregularities, extending nearly a mile from the shore. Its general bearing is about N. by E., and the distance 12 miles; from Tynemouth Castle to Sunderland Point, the direct bearing and distance are nearly N. by E., $11\frac{1}{2}$ leagues; from Coquet Island to Sunderland Point, the bearing and distance are N. by E., 15 miles. Half-way between Aln-Mouth and Sunderland Point, upon a projecting neck of cliffy sand, stand the ruins of Dunstanborough Castle, forming a conspicuous mark, and situated close to the sea: these serve to point out this part of the coast, and cannot well be mistaken for any other object.

Cresswell Hall, open south of Hauxley Point, S.S.W. $\frac{1}{4}$ W., clears Aln-Mouth Rocks, Bulmer Bush, and Bulmer Stile. Off Newtown cliffs* there are two other *rocks*, named the *Faggot* and *Barneyard*, lying $\frac{3}{4}$ of a mile from the shore; and one within them, named *Wittingham Carr*. Bamborough Castle, open of Beadnel Point, bearing N. by W. $\frac{1}{4}$ W., clears the Barneyard and the above shoals.

To the northward of Sunderland Point, lie the Farn and Staples Islands. Farn Island lies from Sunderland Point N. $\frac{1}{4}$ E., distant $2\frac{1}{2}$ miles; and the Staples Light Island N.E. by N., nearly 4 miles. From Tynemouth Castle to the Staples, the course is N. by E. $\frac{1}{4}$ E., and the distance about 13 leagues. To the N.N.W. of Sunderland Point, about a league, is the remarkable and extensive remains of Bamborough Castle, where a most humane institution is established, for the relief of vessels in distress, and mariners shipwrecked on this coast; the particulars of which are as follow, adopted and published with the approbation of the Corporation of Newcastle-upon-Tyne.

An ACCOUNT of the SIGNALS made use of at BAMBOROUGH CASTLE, in NORTHUMBERLAND.

A GUN (a nine-pounder), placed at the bottom of the Tower, to be fired as a signal, in case any ship or vessel be observed in distress, viz.:—

* A buoy has been laid down on the rocks off Newtown Point.
[NORTH SEA.]

ONCE, when any ship or vessel is stranded or wrecked upon the islands, or any adjacent rock.

TWICE, when any ship or vessel is stranded or wrecked behind the Castle, or to the northward of it.

THRICE, when any ship or vessel is stranded or wrecked to the southward of the Castle; in order that the Custom-house officers, and the tenants, with their servants, may hasten to give all possible assistance, as well as to prevent the wreck from being plundered.

In every great storm, two men on horseback are sent from the Castle, to patrol along the coast, from sun-set to sun-rise, that, in case of an accident, one may remain by the ship, and the other return to alarm the Castle. Whoever brings the first notice of a ship or vessel in distress, is entitled to a premium, in proportion to the distance from the Castle; and, if between 12 o'clock at night and 3 o'clock in the morning, the premium to be double.

A large flag is hoisted when there is a ship or vessel seen in distress upon the Farn Islands, or Staples, that the sufferers may have the satisfaction of knowing their distress is perceived from the shore, and that relief will be sent as soon as possible. In case of bad weather, the flag will be kept up, a gun fired morning and evening, and a rocket thrown up every night from the north turret, till such time as relief can be sent. There are also signals to the Holy Island fishermen, who, by the advantage of their situation, can put off for the islands at times when a boat from the main land cannot get over the breakers. Premiums are given to the first boats that put off for the islands, to give their assistance to ships or vessels in distress; and provisions and liquors are sent in the boats.

A bell on the south turret will be rung out every thick fog, as a signal to the fishing-boats; and a large swivel, fixed on the east turret, will be fired every fifteen minutes, as a signal to the ships outside of the islands.

A large weather-cock is fixed on the top of the flag-staff, for the use of the pilots.

A large speaking-trumpet is provided, to be used when ships are in distress near the shore, or are run aground.

An observatory, or watch-tower, is made on the east turret of the castle, where a person is to attend every morning at day-break, during the winter season, to look out if any ship be in distress.

Masters and commanders of ships and vessels in distress, are desired to make such signals as are usually made by people in their melancholy situation.

Here rooms, beds, and support, are provided for shipwrecked seamen. Cellars and storehouses for depositing their goods saved from the wreck. Screws for raising ships; chains for weighing vessels; blocks, tackle, cables, handspikes, ropes, and every necessary is ready for the relief of ships in distress or wrecked; and when any dead bodies are cast on shore, coffins and funeral expenses are furnished gratis.

SUNDERLAND POINT, HOLY ISLAND, FARN, AND STAPLES ISLANDS, AND DANGERS ADJACENT.

Description of the Land, &c.

SUNDERLAND POINT, or the **SNOOK**, is formed by a low cliff, about 20 feet above the level of high water, with some rocks projecting from it, partly covered at low water, and a detached rock, called the *Grimstone*, just visible at low water. Near the point stands the remains of a windmill, in appearance much like a small round tower. About $\frac{1}{2}$ a mile to the northward of the point, are the North Sunderland Sea Houses, close to the beach. Here is a pier and small dock, with 13 feet water, spring-tides, 7 neap, high tides; but dry at low water. Two small beacons stand at the south side of the entrance, for warping out by.

BAMBOROUGH CASTLE stands on a rocky foundation, of considerable elevation, with sand-hills on each side of it, in latitude $55^{\circ} 36' 42''$ north, and longitude $1^{\circ} 42' 8''$

west; the principal tower appears perfect, and is inhabited. At its N.W. side is a mill, and to the north-eastward is a battery; near it is the town of Bamborough, with a church, serving as a mark; and to the N.W. are the Budle Hills, which extend along the south side of Warnham Flats; near the northern extremity of which, is the white signal-house, with red tiles.

The country, in the immediate vicinity of the coast between Sunderland Point and Bamborough Castle, is flat; but a few miles inland it rises to a hill, or ridge, of cultivated land, extending parallel to the coast. At a considerable distance to the S.W. of the point, is Heffer-law Hill, distinguished by a plantation on its northern summit, and seemingly with a house on its southern part, the land sloping gradually to the southward; while to the northward, after forming a curve, or hollow, it rises again to a higher and more extensive hill, and then declines to the level of the before-mentioned ridge; on the north part of which, but to the S.W. of Bamborough Castle, is Hebron Hill, which, being higher than the ridge, and uncultivated, may be easily known. The tops of some of the Cheviot Hills,* which are much higher and larger than the Hebron, are visible to the N.W., or inland, from it. On the northern declivity of the largest is a currach, or pyramid of stones, used as a mark to the shepherds, when the hills are covered with snow. The villages and houses in the neighbourhood of the coast, between Sunderland Point and Bamborough Castle, and which are visible from the sea, taken in a regular order from the southward, are as follows:—

NORTH SUNDERLAND SEA HOUSES are situated nearly $\frac{1}{2}$ a mile to the northward of the point, and close to the beach, where, as before observed, there is a pier and small dock, which has 13 feet at high water, spring-tides, and 7 feet neap, but becomes dry at low water. The rocks on which the pier is built, as well as those to the southward of the entrance, projecting out a considerable way to the eastward, are dry at low water. The southern building, with red-tiles, is the granary, at the south end of which there is a post placed about 3 yards off. The leading-mark between the rocks, until you come to the pier-head, is to open the space between this post and the end of the granary. You will see two wooden beacons on the south side of the entrance: these are for warping out. There is another small beacon on the northern side of the creek, and some limekilns to the westward of the pier, where vessels load with that article, and also with corn. On the rocks at the S.E. side of the pier, there is a long building, called the Herring House, in an east-and-west direction, which has become an excellent mark along the coast. If a vessel be bound in here, she should keep the Megstone and Farn Island touching, until a pilot comes on board.

Hovel House is a small dwelling standing near to, and on the south side of, Sunderland Sea Houses. North Sunderland is a large village situated to the west of Sunderland Sea Houses. Shorestone comprehends a farm and village standing to the north of the Sea Houses, and between is the remains of a windmill, similar to that upon Sunderland Point. Near the coast is a colliery, with a high steam-engine chimney. New Shorestone is to the west of Shorestone village, and consists of a new house and offices, covered with blue slates. About half-way between the Sea Houses and Bamborough Castle, and close to the beach, is Monkhouse, covered with red tiles. Here is a sort of landing-place between the rocks, where you may obtain fresh water. Elford is a little village, somewhat elevated, with trees about it, and situated at a considerable distance from Monkhouse. Green Hill is to the northward of Monkhouse, and is merely a farmhouse, with offices adjoining; there is a small house to the westward of it, usually called Fowberry House. Between Green Hill and Bamborough Castle are some barns, covered with red tiling. Glororum stands to the S.W. of Bamborough, and is built upon rising ground; to the eastward of it are some trees, which are very conspicuous; and between Glororum and Bamborough Castle is a small house, called Dukesfield. There is also a high steam-engine chimney at Glororum, which is used as a mark.

HOLY ISLAND, or LINDISFARN, lies about $\frac{1}{2}$ mile from the main land, between which and a small low islet, called the Old Law, there is a channel, or harbour. The eastern shore is foul and rocky. The castle stands on the east side of the harbour, in latitude $55^{\circ} 40' 20''$ north, and longitude $1^{\circ} 46' 38''$ west, and is built on a rocky

* The highest of the Cheviot Hills is 2,670 feet in height, and is in latitude $55^{\circ} 29'$ north, and longitude $2^{\circ} 8'$ west.

round hill. The town, called Lindisfarn, is on the west side of the island. The ruins of its abbey, the belfry of its church, the beacon on the Heugh, or look-out hill, and the square building near it, are all used as marks in the navigation of the coast and harbour. A buoy is placed on the outer end, or S.E. point of the Stone Ridge. It is strongly recommended, that every vessel entering Holy Island harbour, should take a pilot.

"On approaching the harbour, the beacons on Old Law must be first looked for. The easternmost one is a brick obelisk, crowned by a wooden triangle; it stands on the beach at high water mark, above which its summit rises 77 feet. The western beacon is similar in form and material, but 25 feet higher, and bears from the eastern one W.N.W. $\frac{1}{2}$ W. The beacon on Emanuel Head (the N.E. point of Holy Island) is a sharp-pointed pyramid, built of stone, and placed near to high water mark, from whence many rocks and large stones extend out nearly $\frac{1}{4}$ of a mile.

"Lindisfarn Castle stands on a picturesque rock; and being 108 feet above high water level, is a very conspicuous mark.

"The Heugh is a dark green hill, to the westward of the castle, and terminates towards the harbour in a rocky cliff. Near the centre of the hill is a wooden beacon, forming the second leading-mark to the anchorage off the Heugh. Near the western extremity of the Heugh, is a small building, without a roof, called the Look-out; to the northward of it, are the magnificent ruins of the cathedral, and to the west of the ruins is the church, the belfry of which is the mark already noticed. The town lies to the northward of the cathedral. Off the western point of the Heugh, there is a small rocky projection, which, at high water, is an island, but joins the Heugh Ridge when the tide is low; it is called St. Cuthbert's Island, and by the pilots Hob Thrush."

It is high water at Holy Island at 2h. 30m., and spring-tides rise 15 feet.

From Bamborough Castle to the south point of Holy Island, the course and distance are N. $\frac{3}{4}$ W., $4\frac{1}{2}$ miles. The island thence runs N.N.E., $1\frac{1}{4}$ mile, to Emanuel Head, which is the north-eastern part of the island, and from whence a sandy flat continues all the way to Berwick.

Directly off Sunderland Point runs out a reef of rocks full $\frac{1}{2}$ a mile, nearly drying at low water, and so steep, that 9 or 10 fathoms are very near them. A small pier, already mentioned, is on the northern side of the point, and the shore is rocky. Sunderland bay is shoal full $\frac{1}{2}$ a mile from the shore, having several reefs, which render it dangerous to come into less water than 10 or 9 fathoms.

The GRIMSTONE is a rocky shoal, situated about $\frac{1}{2}$ of a mile to the eastward of Sunderland Point, over which the sea commonly breaks, and requires a wide berth to be given to it in passing. The rocks at the Sea Houses project to the eastward a considerable way, and the coast continues rocky for more than $\frac{1}{2}$ a mile to the northward of the pier.

The OUT CARS are situated more than $\frac{1}{2}$ of a mile to the eastward of low water mark, and between the Sea Houses and Monkhuse Rocks. They dry at low water, and commonly have breakers.

The *Horse Shoe Start Rock* is one of those lying a little to the S.E. of the Monkhuse, and stretching out a considerable way from the shore. *Islestone* is another, being a large rock, extending to the south-eastward of Bamborough Castle, its extreme point lying E.S.E. $\frac{1}{2}$ S. from it, distant about a mile; the mark for it is, Hallidown Hill on with the look-out on Holy Island. There are 4 fathoms water almost close to this rock, and between it and the Farn Island 10 to 14 fathoms. From Islestone to Budle Point and the bar of Warnham Creek, the shore is chiefly rocky, and the land low; between it and Holy Island is *Warnham Flats*, at the north end of which is Holy Island bar; within this is the harbour, lying at the south side of the island, between it and the Old Law, and inside the Stone Ridge. There are several rocks in the vicinity of Holy Island, which will be noticed hereafter.

* The above description of the principal buildings on Holy Island, and many of the following marks and directions, are from the "Sailing Directions from Sunderland Point to Berwick, including the Farn Islands, by Commander E. J. Johnson, R. N." The same officer has made an excellent survey of this intricate and dangerous part of the coast, which, with the directions, are published at the Hydrographic Office, Admiralty.

The FARN, or FERN ISLANDS.—The largest Farn Island is a *rocky islet*, about 100 paces over, having two lighthouses built upon it; it bears E. by S. from Bamborough Castle, distant 2 miles, and is the highest of the group, steep and cliffy to the south-westward, but sloping downward to the N.E. The high lighthouse is situated about 80 feet from the S.W. cliff, coloured white, and the lantern red; this light revolves, is visible all round the horizon, and shows the full face of the reflector every 30 seconds, the centre of which is elevated 82 feet above the level of high water. The low light stands near the N.W. part of the island, and can only be seen in a northerly direction; it bears from the high light N. by W. $\frac{1}{4}$ W., having its lantern also painted red, and a fixed light, 38 feet above high water. There is a remarkable old square building at the N.E. part of this island, called St. Cuthbert's Tower, whereon a light was formerly exhibited. The lights in one, bearing S. by E., will lead between the Goldstone and Plough Seat, but directly across the Megstone.

E.S.E. from this island are *two little rocky islands*, called the *Wide Opens*, or *Little Farns*, and to the eastward of these are *two black rocks*, named the *Scare Crows*, or *Start Cars*; these are always above water, and on their southern side steep-to, having 9 and 7 fathoms close to them. These rocks and islands are all clustered together, for though separated at high water by different channels, at low water they are all nearly dry.

The BUSH.—About $\frac{1}{4}$ of a mile to the E.S.-eastward of the Scare Crows, is a *reef of rocks*, called the *Bush*; the S.E. end of which is visible at low spring-tides, and in S.E. gales has violent breakers. The marks for this part of the reef are, the windmill, at the north end of Bamborough Castle, on with the S.E. high cliff of the easternmost Wide Open; and the south end of the granary at Sunderland Sea Houses, open to the north of the plantation on Heffer Law Hill; the signal-house on Budle Hill, open to the southward of Farn Island, W.N.W., leads to the southward of the Bush, and every other shoal.

To the eastward of the Farn, and north of the Inner Wide Open, is a semi-circular *ridge of rocks*, its northern part stretching toward the Farn, forming a sort of basin, called the *Kettle*, having about 2 fathoms water within it; the rocks are all nearly covered at high water. The entrance to this basin is from the northward, and when sailing in, keep in the mid-channel with the beacon on Emanuel Head, just touching the east side of the Megstone, and remember to allow for the set of the tide. Northward of this ridge is *Knox's Reef*, which stretches out nearly $\frac{3}{4}$ over towards the Staples; some part of it is almost dry at low water, but it deepens toward its outer point to 2 fathoms. The marks for this point are, Hebron Hill, midway between the Farn Island lighthouses, and the limekilns at Sunderland Sea Houses, in a line with the eastern Scare Crow.

The STAPLES ISLAND is the westernmost of a cluster of small islands, separated by narrow channels, and filling the space of $\frac{1}{4}$ a league. This island is of a triangular form, having the remains of a former lighthouse upon it. On its southern side are some *tall rocks*, like broken pillars, 40 feet high, called the *Pinnacles*; to the north-eastward of the Staples Island is the Brownsman, an irregularly shaped island, having the remains of another lighthouse on its northern end, bearing from the high lighthouse of the Farn E.N.E.; near this you will see a square tower, and an old house with red tiling.

To the northward of the Brownsman are the two Wamses, from which a *rock* projects to the west and north-west about a cable's length; they are divided from the Brownsman, and also from each other, at high water, by narrow channels.

About $\frac{3}{4}$ of a mile E.N.E. from the old lighthouse, lies the *Longstone*, a *large rock*, stretching north and south about $\frac{3}{4}$ of a mile. Between the Wamses and Longstone are a number of *ragged rocks*, some above and others under water. These are called the *Blue Caps*, and the larger one the *Hawker*.

The LONGSTONE, at high water, is separated into several parts, although at low water it forms but one island. Its eastern part is the highest, and is formed of rugged rocks. In 1826, a lighthouse was erected upon it, instead of that which formerly stood upon the Brownsman. The tower of this lighthouse, painted red, stands about 200 yards W.S.W. from the water's edge, and the light is elevated 75 feet above the level of the high water mark, at spring-tides. This light, like that in the principal tower upon Farn Island, revolves, showing the full face of a reflector every 30 seconds. It

bears E.N.E. from Farn high lighthouse. There is a *shoal* extending from the N.E. point of the Longstone, a short distance in that direction.*

The KNAVESTONE is the easternmost rock that dries, lying E. by S., $\frac{1}{2}$ of a mile from the north end of the Longstone. The high light on Farn Island in one with the Longstone light, bearing W.S.W., leads over it. It is above water from half-ebb to half-flood, but there is a ripple over it at all times, which will point out its situation; it appears black and flat. A *shoal reef* extends from the northern part of the rock about a cable's length, and it is also shoal at its southern part. There is a *rocky shoal* to the north-eastward of the Knavestone, called the *Whirl Rocks*, over which is continually a rippling or race. One of these has only 2 feet over it, while the others have 2 to 4 fathoms over them. The Longstone light bears S.W. by W. $\frac{1}{2}$ W. from them. But as the tides near these rocks and the Knavestone are extremely rapid, and whirl in various directions, vessels are recommended never to approach them within 2 miles.

The GUN REEF consists of *two patches of rocks* running out from the S.W. point of the Staples, and curving round towards the northern end of the Brownsman. The sea-weed along this reef may be seen at low ebbs, and *two small rock-heads* show themselves at about 2 hours' ebb. The mark for the western part of the Gun Reef is, the plantation on Heffer Law Hill open to the N.W. of the Sunderland Sea Houses.

The CRUMSTONE is a *flat rock*, above water, lying nearly a mile S.E. by E. from the southern part of the Staples Island, and a mile south from Longstone lighthouse. A reef, called the *Callers*, extends nearly $\frac{1}{2}$ a mile from the Crumstone to the N.W., its extreme bearing from the Longstone light S. by W. $\frac{1}{4}$ W., with the northern edge of the Megstone touching the southern edge of Staples Island, and Glororum engine chimney in a line with Farn high light. About a cable's length S.W. by W. $\frac{1}{2}$ W. from the Crumstone, is a small rock, called the *Fang*, with 9 feet over it at low water. The Crumstone is the southernmost of the Staple rocks; it bears from the Knavestone S. by W. $\frac{3}{4}$ W., $1\frac{1}{2}$ mile, and from Sunderland Point N.E. $\frac{1}{2}$ E., $3\frac{1}{2}$ miles.

To the northward of Farn Islands lie the *Megstone, Swadman, Elbow, Ox Scar, and Glororum Shad Rocks*.

The MEGSTONE is a *little black rock*, always above water, bearing about N. by W., distant rather more than a mile from Farn Island high lighthouse. The ground between these is rocky, with from 4 to 9 fathoms water.

The SWADMAN is a *rocky reef*, running about W. by N., distant $\frac{1}{2}$ a mile from the Megstone; its western extremity dries at spring-ebbs, and has a black buoy placed near to it, which bears N.N.W. $\frac{3}{4}$ W., distant $1\frac{1}{4}$ mile from the Farn high lighthouse, and W. $\frac{1}{4}$ N. from the Longstone lighthouse. There are 7 fathoms close to it, 9 fathoms a little way off, and 10 fathoms mid-channel between it and the shore. The marks for the western end of the Swadman are, Bamborough Church in one with the highest sand-hill near it, which lies to the northward of the castle, and the base of the eastern beacon, on Old Law, seen clear of the adjacent sand-hills; but the western end of the reef may be avoided, by keeping the beacon on the Heugh, at Holy Island, in one with the church belfry; in which position the base of the east beacon on the Old Law will be shut in with the low point of the sand-hills.

The OX SCAR is a *small rock*, appearing above water a little after half-ebb, lying $\frac{1}{2}$ a mile E.N.E. from the Megstone; N. $\frac{3}{4}$ E. from the Farn high lighthouse; and W. $\frac{3}{4}$ N. from the Longstone lighthouse. Its marks are, the Megstone and the highest tower of Bamborough Castle in one, and Farn high lighthouse midway between St. Cuthbert's Tower and the low lighthouse. There is a *rocky shoal* running from it to the westward, which at low tides becomes visible; on the extreme or western part of it are 2 fathoms.

* *Times*, 8th, June 1842.—Not long ago the gentlemen of the London Trinity House resolved to erect upon the Longstone Rock, close to Mr. Darling's lighthouse, two cottages; one, we understand, for Mr. W. Brooks Darling, (Grace's Brother,) and the other to be a reserve for the accommodation of the sufferers from shipwreck, which the dangerous navigation of these islands, renders of such frequent occurrence. About 20 men are already employed on the rock, working the stones for the buildings, which, it is said, will cost the Trinity House above £2,000. Mr. William Thompson and Mr. Andrew Gordon, of North Sunderland, are contractors for the work, under the superintendence of Mr. Duncan the Agent for the Trinity House.—*Berwick Warde*.

Between Farn Island and the Ox Scar is also a *small shoal*, called the *Elbow*, with only 2 feet water over it. This is much in the way of shipping passing between the Ox Scar and Megstone, and in N.E. gales generally breaks. The marks for it are, the low houses at Shorestone, open to the southward of the south part of Heffer Law Hill; and Farn high light, between St. Cuthbert's Tower and the low light, but rather nearer to the latter. In a line between the old lighthouse on the Brownsman and Bamborough Castle, and to the northward of Knox's Reef, is *Ilestone Shad*, a *rocky patch*, of 1½ fathom, which breaks with north-easterly gales. It bears from Farn high lighthouse N.E. ½ E., nearly a mile distant, and from Longstone lighthouse W.S.W. ¾ W. The marks for it are, Dunstanborough Castle open to the eastward of East Wide Open, and Ilestone Rocks, near the coast, on with Hebron Hill.

Between Ox Scar and the Wamses, is a *rocky shoal*, of 3½ fathoms, breaking during gales from the N.E., bearing W. ½ N. from Longstone lighthouse, and N.N.E. ½ E. from Farn high lighthouse, distant more than a mile. The marks are, Dunstanborough Castle, touching the western part of Wide Open; the signal-house on Budle Hill, open to the north of the Megstone; or Glororum village on with Hebron Hill; this is called the Glororum Shad.

In an E.S.E. direction from Holy Island Castle, is a *rocky flat*, with several *dangerous rocks* upon it; these are the *Plough*, *Plough Seat*, *Wingate*, *Minscore*, *St. Nicholas*, *Goldstone*, *Stiel*, and *Gussard*.

The **PLOUGH** appears at half ebb, is small, and lies E.S.E. ½ E. from Lindisfarn, or Holy Island Castle, distant about ½ a mile; it uncovers at half ebb, showing about 7 feet in height at low water. The part of the rock that dries is 40 yards long, and on its extreme there is a black wooden beacon, the top reaching only 2 feet above high water. Close to the westward of this rock, there are 3½ fathoms water, deepening to 4½ fathoms in the mid-channel, but shoaling pretty regularly towards the castle point.

The **PLOUGH SEAT** extends about ½ of a mile E.S.E. ¾ E. from the Plough, and partly dries at spring-ebbs; its eastern point has a red buoy upon it, but this is sometimes driven to the south-westward in severe gales. The look-out on Holy Island, touching the north side of the castle, will lead directly over the Plough and Seat.

The **WINGATE** is a *small rock*, lying E.N.E. ¾ E., nearly ½ of a mile from the Plough beacon, having not more than 6 feet over it at low water. The marks for it are, St. Cuthbert's Tower open to the west of the Megstone, at low water, and the ruins of Holy Island Cathedral in a line with the north end of Wingate Gap.

MIN SCORE ROCK lies about ½ of a mile N.E. ¾ E. from the Plough beacon; and has 9 feet over it at low water. The marks for it being Black Law, just clear of the high water mark at the castle point, and the ruins of the Cathedral in a line with Wingate Gap.

The **GOLDSTONE** is a *dangerous rock*, rather more than a mile S.E. by E. ¾ E. from the Plough Seat; it is very small, and visible at the last quarter ebb, having a black buoy near its western side. From it runs a *narrow reef* extending ¾ a mile S.E. by E. ½ E.; this is called the *Stiel*, and dries at low spring-ebbs. The mark for the Goldstone is, the look-out on the Heugh, touching the south side of Holy Island Castle. The mark for the western part of the Goldstone, is the Megstone eastern edge, touching the western side of Farn Island. The marks for the eastern part of the Stiel are, the north side of the Heugh, touching the south side of Lindisfarn Castle, and the Megstone well open to the east of Sunderland Point.

ST. NICHOLAS ROCK is small, and lies about ½ of a mile N.W. from the Goldstone, having 15 and 16 feet water over it. The marks for this rock are, the east side of the Megstone, just open to the west of Farn Island, and Kyloe Church just open to the north side of Holy Island Castle.

The **GUSSARD** is another *small shoal*, about the size of a ship, lying ½ a mile S. ½ E. from the Goldstone, and having 2 fathoms over it at low water. Its marks are, the east side of the Megstone, touching the west side of Farn Island, and the beacons on Old Law in a line with the south part of Wingate Gap.

The N.E. side of Holy Island is encumbered with *rocks*, rendering it dangerous to sail near it. The Snipe Point lies N.W., full ¾ of a mile from Emanuel Head, having a *reef of rocks* stretching N.E., ½ a mile from it. Keeping Bamborough Castle well outside of Emanuel Head, clears it. At ½ a mile from Emanuel Head, are 7 to

9 fathoms; but at the distance of $1\frac{1}{2}$ mile, 13 to 16 fathoms. From Snipe Point, Holy Island stretches W.N.W., about 2 miles, to Snook End, forming a long sandy point, with small hillocks. A *sandy flat* extends itself all the way from Snipe Point to Berwick, being generally called *Holy Island Flats*, or the *Sand Ridge*.

Outside, and at a distance from the land, lie several *dangerous rocky shoals*; these are called the *Park Dike*, *Wingate*, *Bean Stack*, *Tours*, *Spittal Hurst*, &c. A vessel may safely pass outside of all these, by keeping the signal-house, on Budle Hill, in a line with the beacon on Emanuel Head.

The PARK DIKE is the southernmost, and lies N. $\frac{1}{4}$ W., 2 miles from Emanuel Head, having only 10 feet over it, but 5 fathoms close to it. The marks for the east end are, Bamborough Church half-way between the beacon and low water mark on Emanuel Head; Lindisfarn Castle just open to the eastward of False Emanuel Head; and Berrington New Hall just clear to the south of Goswick New Hall. It extends W. by N., $\frac{1}{2}$ a mile, and is about a cable's length wide.

The WINGATE REEF lies to the westward of the Park Dike, and has only 9 feet over its shoalest part. The eastern extremity bears N. by W. $\frac{3}{4}$ W., $2\frac{1}{2}$ miles from Emanuel Head; and the marks for it are, Berrington New Hall clear to the north of Goswick New Hall; and Farn Island high light a little open to the eastward of the beacon on Emanuel Head. This reef extends W.S.W. $\frac{1}{2}$ W., nearly a mile; but no vessel should venture to the westward of it at any time.

The BEAN STACK lies close to the northward of Wingate Reef, and nearly parallel to it, with only 9 feet water over it. The eastern end bears N.N.W. $\frac{1}{4}$ W., $2\frac{3}{4}$ miles from Emanuel Head, with Lindisfarn Castle in a line with the centre of the banks near Snipe Point. About $\frac{1}{4}$ of a mile to the northward of the Bean Stack, is the east end of the *North Bean Stack*—a large track of *foul ground*, extending above $\frac{1}{2}$ a mile W. by N., with 5 fathoms in some parts. There is another *patch of foul ground* a little farther to the northward, usually called the *Northern Tours*, having 6 fathoms over its shoalest part at the eastern end; and again to the northward of this, is another *rocky patch*, called the *Inner Hurst*, over which are 6 fathoms at low water.

The TOURS REEF lies directly north from Emanuel Head, distant $2\frac{1}{2}$ miles, outside of, and parallel to, the Park Dike: on it are 12 feet, and $4\frac{1}{2}$ fathoms close to its edge. The mark for the eastern parts of the Tours and Park Dike, is Emanuel Head just open to the westward of Bamborough Castle. Between the Pike Dike and Tours, are from 7 to 9 fathoms; and a similar depth between them and Snipe Reef. Off their eastern sides are 12 and 13 fathoms, deepening fast towards the offing.

The SPITTAL HURST is a *rocky shoal*, of about 2 cables in extent, lying S.E. by E. $\frac{1}{2}$ E., $4\frac{1}{2}$ miles from Berwick lighthouse; and north, a little westerly, 5 miles from Emanuel Head. With heavy gales of wind, and spring-ebbs, the breaking of the sea is seen on this reef, both from Berwick and Holy Island; but there does not appear to be less than 5 fathoms upon it at low water, with 9 or 10 fathoms round it. The marks for it are, the easternmost part of Bamborough Castle in a line with the beacon on Emanuel Head; and a remarkable round clump of bushes, at a considerable distance inland, in a line with Cheswick.

The Trinity House Directions for Ships sailing by the Improved Lights, at the Farn and Staples Islands, corrected to correspond with the New Light on the Longstone.

LIGHTHOUSES.—The high lighthouse on the Farn is situated near the S.W. point of the island, about 60 to 100 feet from the cliff, which is 50 feet above the sea, and steep-to. The light in the tower is 82 feet above the level of high water, spring-tides.

The other principal lighthouse is built on the Longstone—one of the outermost of the Staples Islands, and the nearest to the Knavestone, which is about 900 yards, or $\frac{1}{2}$ a mile to the E.N.—eastward of it. This tower stands about 200 yards from the water's edge; and the light in the tower is 75 feet above the level of high water mark, spring-tides. The lights in both these towers revolve, and show the full face of a re-

sector every $\frac{1}{2}$ minute, bearing from each other W.S.W. and E.N.E., about $2\frac{1}{4}$ miles distant.

There is also a third, or low light, placed upon the Farn Island, as requested by the trade, for a leading direction through the Sound, between the Goldstone and the Plough, near Holy Island. The distance between this low light and the high light on the Farn, is 560 feet; and they bear from each other S. by E. and N. by W., leading somewhat nearer the Goldstone than the Plough, and directly over the Megstone, which rock is distant from the Farn about a mile. This light is not seen, except in a northerly direction; but the two principal lights are visible all round the horizon.

GENERAL INSTRUCTIONS FOR THE USE OF THE LEAD.—In giving directions for passing these dangerous islands and shoals, upon which there have been so many losses of lives and property, it is to be observed, that they have been principally occasioned by neglecting the necessary attention to the lead. The Corporation therefore earnestly recommend to all masters and pilots, when they approach these lights, bound either to the northward or to the southward, to keep the deep-sea lead going upon all that part of the coast, within the distance of Coquet Island and St. Abb's Head; and if they find themselves in less than 30 fathoms, to haul out into that depth of water, which is the least that can be depended upon, to carry a vessel far enough to the eastward to be clear of all dangers, and will bring them in sight of the lights; and when they are in one, bearing W.S.W., which leads over the Knavestone (the easternmost rock), you may proceed, either northward or southward, safe from the dangers of those shoals and islands.

But all masters (and especially strangers to this navigation) are particularly cautioned not to attempt sailing amidst or within those islands or shoals, more particularly on account of the various settings of the rapid tide running in the different sounds between the islands, where probably very little space is to be found that is free from rocks, and fit for anchorage. The only two roadsteads recommended are, the one under the Farn, the light bearing N.N.W., distant about 3 cables' length, in 8 or 10 fathoms; the other in Scate Road, off Warnham Flats, the Farn light bearing S.E., and the high light on the Longstone E. by S., in about 7 or 8 fathoms.

If, in making these lights, bound to the northward or southward, and with the wind from the eastward, you cannot pass them in 30 fathoms, or upwards, it is recommended to make a board, if you find it practicable to work to windward, rather than pass through the Inner Sound; but in case of hard gales, and you are in danger of being forced upon the shore, by tacking, to keep the sea, and you cannot pass outside of the islands in 30 fathoms by night, or cannot in the day-time go to the eastward of the breach on the Knavestone (which is only dry at half-ebb), the only resort in such cases will be to take the Sound.

FOR SAILING THROUGH THE SOUND TO THE NORTHWARD.—

Under the foregoing circumstances, if bound to the northward, steer for the Farn high light, taking care to avoid the Crumstone Rock (the southernmost of the Staples Islands), from which the lighthouse on the Longstone bears north, a little easterly, distant nearly $1\frac{1}{4}$ mile; and the light on the Farn about W. $\frac{1}{4}$ N., distant 2 miles. To sail clear of which, bring the Farn light no farther to the westward than W.N.W.; and steer in to the westward, until you have the Farn high light bearing N.W. (to avoid the Scare Crows and Wide Opens), when you may steer for the light, and pass the S.W. point of the Farn Island at $\frac{1}{4}$ a cable's length or less, it being steep-to.

When the gale is such as will allow you to steer to the northward, if you can make good a N.N.E. course, you may haul up, in order to pass through the Sound, between the Megstone and Ox Scar (or South Goldstone), and bring the high light as much to the eastward of the low light as their difference of height (that is, the low as much to the westward of the high light as it is lower than the high light), which will take you about 170 yards to the eastward of the middle part, or about 100 yards to the eastward of the dry part of the Megstone Rock, in 6 fathoms. This rock is always 12 feet above water, and steep-to on the east and north sides; so that at 4 or 5 fathoms distance from the dry rock, on the N.E. side, there are 4 fathoms water, increasing to 6, and shoaling from 6 to 3 fathoms towards the reef, which extends about $\frac{1}{3}$ across the Sound from the Ox Scar towards the Megstone, and leaves the Sound only about 500 yards wide between those two rocks. In this passage, between the Farn and the Megstone, there are about 8 or 9 fathoms; and in the Sound, between the Megstone and the Ox Scar,

about 6 fathoms, with the lights open as above described. After passing the Megstone (either in sight), or upon deepening again 1 or 2 fathoms, you may bring the lights in one, and proceed in this line. The soundings will vary from 9 to 7 fathoms; and nearly abreast of the Gussard's Seat to 6, or $5\frac{1}{2}$, deepening to 11. When you are abreast of the Goldstone, and in 12 fathoms (at low water), you are past all danger, and may then proceed, hauling out to the northward, and opening the high light to the eastward of the low light, till you come into 16 or 18 fathoms.

FOR SAILING WITHIN THE LIGHT, OR ANCHORING IN THE ROADS, IF BOUND TO THE NORTHWARD.—In case you prefer going through the Inner Sound, having passed the high light on the Farn, bring it S.E. $\frac{1}{2}$ S., and keep it so until you have the light on the Longstone E. $\frac{1}{2}$ S., to avoid the Swadman, and the reef which extends to the westward from the Megstone; and when you have these two lights on the above bearings, or can see Bamborough Castle about S.W. by W., and can make good a N.N.E. course, you may haul to the eastward, and bring the high and low lights upon the Farn in one, proceeding in that line as before described; but if you have any doubt of regaining this line, by either of those passages, it will be necessary to anchor, if the wind is E. by N., or more northerly, under the Farn Islands, the high light bearing N.N.W., distant about 3 cables' length, in 8 or 10 fathoms. If more easterly, proceed for Scate Road, off Warnham Flats, by steering N.W. from the high light on the Farn, and keeping it S.E., until the light on the Longstone bears E. by S., or Bamborough Castle bears S. by W., in 7 or 8 fathoms; where, if forced from your anchors, you stand the best chance of saving both your lives and property.

FOR SAILING WITHIN THE LIGHTS TO THE SOUTHWARD.—When, in proceeding from the northward to the southward, after having passed St. Abb's Head, you are prevented, by heavy gales from the eastward, from hauling into 30 fathoms of water, as in the foregoing supposition; and falling into 16 or 18 fathoms, with heavy gales upon a lee shore, you are not able to get to the eastward (the wind being at east or E. by N.), you had better tack to the northward, and keep the Frith of Forth open, than attempt to proceed; but if, from the appearance of the night, it is judged prudent to proceed, you ought not to come into less than 16 or 18 fathoms, to avoid the shoals north of Holy Island, until you make the lights. If then, at a great distance, you do not see the low light, keeping the high light on the Farn about S. $\frac{1}{2}$ E., will take you to the eastward of the leading-line, to avoid the above shoals; and upon making the low light, if it be to the westward, you may edge off to the westward, until you have the two lights in one, as before described, which will take you between the Goldstone and the Plough; and you may thence proceed in that line, until you have the light on the Longstone S.E. $\frac{1}{2}$ E., when, if you can, haul to the eastward, so as to bring the high light as much to the eastward of the low light as their difference of height (as before); you may proceed in that direction of the lights, to pass to the eastward of the Megstone; and from the Megstone, to steer so as to pass $\frac{1}{2}$ a cable to the westward of the light on the Farn.

If, when the light on the Longstone bears S.E. $\frac{1}{2}$ E., being in the line of direction of the two lights, you cannot haul up to the eastward, and find it advisable to anchor in Scate Road, steer for it S.W. $\frac{1}{2}$ W., until you have the bearings of the lights, as before mentioned, in 7 or 8 fathoms; or, if you mean to proceed through the Sound, in that case, instead of steering S.W. $\frac{1}{2}$ W., steer S.S.W., until you bring the high light on the Farn S.E. $\frac{1}{2}$ S., which you may then steer for, and it will take you to the westward of the Swadman; when, passing $\frac{1}{2}$ a cable to the westward of the Farn, you may safely proceed to the southward.

GENERAL CAUTION.—These directions are given, supposing it to be night-time, and stormy weather; but they may be useful in the day-time also; however, it cannot be too earnestly impressed on the minds of all who have charge of vessels passing this intricate navigation (except the constant traders to and from Berwick), not to involve themselves among these islands, either by day or night, with favourable or with contrary winds.

FURTHER DIRECTIONS FOR SAILING THROUGH AND AMONG THE FARN AND STAPLES ISLANDS.

SHIPS using this navigation, and passing outside the Staples with but a scant wind and a sea, must be particularly careful not to be drifted among these islands, especially with flood-tides; and at night, or in thick weather, they should always give them a wide berth, never coming into less than 32 and 33 fathoms, for even that depth is but about the distance of a mile from them, and there are 20 fathoms close to some of the greatest dangers. Indeed, it is recommended not to approach these islands nearer than 35 fathoms.

When you have passed the Staples Islands at the above depth, proceed until you have brought the Longstone light to bear S.W. by S., when the Farn high light will appear broad open to the northward of it, and vessels bound to Berwick may then haul in till the Longstone light bears S.S.E., but no farther to the eastward; then steer N.N.W., until Berwick pier light bears N.W. by W. $\frac{1}{4}$ W., which course will lead you in between the Inner Hurst and Spittal Hurst, over which there are 5 or 6 fathoms water, and to the northward of all the dangers in Berwick Bay.

INNER or FARN ISLAND SOUND.—Mariners desirous of going through between these islands, will take the common passage between Farn Island and the main. To sail through this channel, bring Hallidown Hill open to the westward of Holy Island Castle, or between the castle and look-out hill; keep these marks on until the tower of the old lighthouse on the Brownman comes open to the northward of the Megstone, then you will have passed the Swadman; or keep Farn high lighthouse S.E., till the Longstone lighthouse bears E. $\frac{1}{4}$ S., or till Bamborough Castle bears S.W. by S.; your course will now be to the eastward, until you bring the Megstone in one with the Farn lighthouses, and this mark will take you between the Plough Seat and the Goldstone; but if before you get through this passage, the wind should change to north or N.W., then stand out to the eastward, taking care to avoid the Gussard, by bringing the beacons on the Old Law in one, until the Megstone comes open of the west side of Farn Island. The Megstone in a line with Sunderland Point, clears the Stiel to the eastward.

In working through between Farn Island and the main, come not nearer the port or larboard shore than to bring the south end of Hallidown nearly in one with the look-out hill, nor nearer to the Swadman than to bring the said hill nearly in one with Holy Island Castle. Both Islestone and Farn Island are steep-to; go not nearer the former than 7 fathoms.

The turning mark between the Plough Seat and the Goldstone, is the Megstone, from side to side of Farn Island.

STAPLES SOUND.—This channel is between the Farn and Staples Islands. It is about $\frac{1}{2}$ of a mile wide, and may occasionally be adopted when you cannot go to the eastward of the Knave-stone. The leading-marks usually given (the south end of Hallidown Hill well shut in over Emanuel Head, or between the head and red cliffs), frequently cannot be seen, nor always depended upon; but care should be taken not to steer for the apparent channel direct, between the Scare Crows and Staples; for the *Bush*, *Knox*, and *Islestone Shad Reefs* are not always visible, although they extend to the eastward above half-way of the apparent passage; therefore, keep well to the eastward, when, if the *Gun Rock* should be visible, there will be no mistake. Be careful to pay particular attention to your soundings, there being in mid-channel 11, 12, and 13 fathoms, shoaling gradually towards the Gun Reef, close to which are 8 and 7 fathoms; and to the westward to 6 and 5 fathoms, which is close to Knox's Reef. Islestone Shad and the Bush, which are the principal dangers, have 6 fathoms close to them. The direct course through the Staples Sound is north and south.

In approaching this passage from the eastward, care must be taken to avoid the Crumstone and the Fang; and when a little to the westward of the Gun Reef, steer north, taking care not to round the S.W. point of the Staples too close.

With leading winds, coming from the northward, and unable to weather the Knave-stone, give the N.W. point of the Wamses a good berth; then steer so as to round th-

Gun Reef, and when to the westward of it, steer south. Attend to your soundings, and keep nearer to the east than to the west side of the channel.

With beating winds, stand no farther to the east than 9 fathoms, nor to the west than 6 fathoms; and when approaching the northern part of the passage, and standing to the westward, tack before the mark for Glororum Shad comes on; and when in the line between Bamborough Castle and Brownsman old lighthouse, tack before the mark for Islestone Shad comes on. In the middle of the passage, when standing to the westward, you should tack before the mark for the easternmost part of Knox's Reef comes on; and when standing to the eastward, tack before the mark for the Gun Reef comes on.

When you are in the southern part of the passage, and standing to the westward, you should tack before the mark for the Bush comes on; and do not stand to the eastward of the Gun Rock.

When the signal-house on Budle Hill is well open to the southward of the south-east cliff of the east Wide Opens, you will be clear of the southernmost part of the Bush, and may stand farther in-shore, if necessary. The tides run north and south.

A vessel may anchor during northerly winds on the south side of Farn Island, where there is a sandy bottom, with 9 fathoms, when Longstone light is just open to the eastward of the Wide Opens, bearing N.E. by E., and Farn high lighthouse N.W. by N.: or Holy Island Castle in one with the S.W. cliff of Farn Island.

SCATE ROADS are so much exposed to the eastward, that they cannot be recommended as a common or secure anchorage, but only as a stopping-place during westerly winds, or perhaps when ships can neither keep the sea nor make Holy Island harbour. When Farn Island high light bears S.E., and Longstone light E.S.E. $\frac{1}{2}$ E., anchorage will be found on a sandy bottom, in 6 fathoms; or you may proceed farther to the northward, until Longstone light bears S.E. by E. $\frac{1}{2}$ E., or till Kyloe Church is seen through the Wide Open; where you will find 5 fathoms about a mile from the shore.

WARNEAM FLATS extend from Bamborough Castle to Holy Island, and dry at half-ebb; the bar, which frequently shifts, lies at the south end of the flats. Budle beacon in one with the pier-head, S.W. by W. $\frac{1}{2}$ W., leads up the Budle creek, after the bar has been crossed. The beacon is removed when the sands shift their places.

HOLY ISLAND HARBOUR.—Holy Island bar, at low water, ordinary spring-tides, in the line of the leading-mark, has 8 feet over it; and there are from 4 to 2 fathoms at the anchorage abreast of the Heugh, but during the equinoctial, or extraordinary spring-tides, there are 2 feet less.

At the N.E. end of the bar is the *Stone Ridge*, a rocky reef, on the outer end of which a buoy is placed, and which continues up the N.E. side of the channel to the harbour; it is entirely covered at high water, and when its top is just visible on the surface of the water, there 20 feet water over the bar in the line of the leading-marks.

At the south side of the entrance is the *Bat*, a small rocky flat, with only 2 or 3 feet water over it at spring-ebbs. The mark for it is, the beacon on the Heugh and the church belfry in one, bearing N.N.W. From the S.W. shore, reaching out toward the Bat, is a rocky reef, mostly dry at low water, called the *Parton Stiel*, bearing S.E. $\frac{1}{2}$ S., distant $\frac{3}{4}$ of a mile from the Black Law. There is a small sandy shoal, with only 6 feet over it, lying S. $\frac{3}{4}$ W. from the castle. This must be particularly guarded against, as it lies very near the intersecting point of the leading-marks into the harbour. Its mark is, the high beacon on the Old Law, just open to the southward of the low beacon. There are other shoals in the channel, which make it requisite to keep the marks well on in entering the harbour.

Within the bar the channel winds to the northward, becoming narrower and deeper as you go in, till abreast of the upper end of the Stone Ridge, where it is only about 2 ships' length broad, and has 4 fathoms at low water. The tide in the harbour runs very strongly during the last half-flood and first half-ebb; that is, from the time the flats are covered until they are dry again.

Directions for sailing into Holy Island Harbour.—Bring the two beacons, which now stand upon the Old Law, in one, bearing W.N.W. $\frac{1}{2}$ W., which will lead over the bar, until the beacon upon the Heugh, bearing N.N.W., and the church belfry, come in one; keeping them so, leads up to the anchorage abreast of the Heugh, in 3 fathoms at low water, with good holding ground.

Vessels coming from the northward for Holy Island, may sail through the Goldstone channel, by keeping the lighthouses on Farn Island in one, over the centre of the Megstone, bearing S. by E. $\frac{1}{4}$ E., until the beacons on Old Law come in a line, and then proceed into the harbour by the marks before mentioned; or they may run through the Goldstone channel, by keeping Outcheester Tower in a line with the N.W. chimney of Warren House, S.W. $\frac{1}{4}$ S.

When outside the Goldstone and all the other shoals, you may pass between the Goldstone and Gussard, by bringing the beacons on the Old Law in a line, W.N.W. $\frac{1}{4}$ W.; and by so keeping them, run into the harbour as before directed.

Or, if you are obliged to take the channel inside the Plough, keep the east end of Budle granary just open to the westward of Kettle Bottom Hill, bearing S. by W., which will clear the Ridge End, till the beacons on Old Law come in a line. You need not at high water, and with a scanty wind from the westward, run so far to leeward as to get the beacons on Old Law in one; for by keeping the church a sail's breadth open to the eastward of the Heugh beacon, it will lead you over the edge of the Parton Stiel, where it does not dry at low water, spring-ebbs; but remember, your draught of water must be consulted; your soundings from the main will be regular; and here you may depend upon a pilot, if it be possible for them to get out to sea.

When the weather is bad, and pilots cannot get off, the flag-staff of the beacon upon the Heugh will be struck across, until a proper time of tide for ships to enter; then it will be raised erect, and a blue flag hoisted.

From EMANUEL HEAD to BERWICK.—From Emanuel to Berwick the course and distance are N.N.W. $\frac{3}{4}$ W., 8 miles; to Whapness N. by W. $\frac{1}{4}$ W., 5 leagues; and to St. Abb's Head N. by W. $\frac{1}{4}$ W., 19 miles.

Vessels steering northward from Emanuel Head, by keeping that point in one with Budle signal-house, S. $\frac{3}{4}$ W., will clear all the shoals in Berwick Bay; and when Berwick lighthouse bears N.W. by W. $\frac{1}{4}$ W., you may steer directly towards it.

BERWICK is a fortified town, situate on the N.E. banks of the River Tweed, having a spire on the town hall, in latitude $55^{\circ} 46' 21''$ north, and longitude $1^{\circ} 59' 41''$ west; and to the northward of the town an octagonal building, called the Old Bell Tower, which, together with the Magdalen Field House, are all conspicuous sea-marks. Berwick is connected to the town of Tweedmouth, on the southern side of the river, by a bridge of 15 arches; but in summer the stream is so inconsiderable that it frequently only occupies two of them. On the south side of the river is a large sand-stone rock, called the Carr, projecting from the shore, round which is the deepest water, and best anchorage in the river. Vessels generally moor there with a fast to a ring in the rock, and an anchor in the stream. The southern side of the entrance into Berwick is a sandy bay, but the north side has a reef of rocks that dry a long way out, along which a pier runs out above 800 yards in length, having on the pier-head a lighthouse, which exhibits two fixed lights; the higher one is lighted through the night, but the lower one, which is a red light, is only shown when there are 10 feet water upon the bar. The tide light, in clear weather, may be seen 5 or 6 miles; but the high light will be visible full 4 leagues, according to the state of the atmosphere.

*The following Directions for Berwick Harbour, are by Commander
E. J. JOHNSON, R. N.*

"VESSELS which have not made the land, should never attempt to run for Berwick Harbour in thick weather, but should keep at sea, in not less than 35 fathoms; and when they have made a good landfall, and reached the vicinity of the harbour, they should not go into less than 18 fathoms, till the proper time of tide. This is indicated at night by showing the red tide light, when there are 10 feet water and upwards on the bar; but no day signal has as yet been established for this purpose. A pilot should be considered as indispensable, for the heavy freshes down the river, when opposed by strong easterly gales, materially change the position of the sands at the entrance; and, with or without a pilot, the lead must be particularly attended to.

"In approaching the harbour from the northward, the two northern Scremmersstone windmills kept in a line S.S.W. $\frac{1}{4}$ W., clears all the rocks to the north of the pier, un^d

the harbour's mouth is open, and the lighthouse bears N.W. by W. $\frac{1}{4}$ W.; but it is important that those who may approach Berwick from the northward at night, should be informed that it is an error to suppose that the pier light can only be seen by vessels which are outside of the Seal Carr, for its reflection sometimes appears almost like a steady light, and can be distinctly seen even by a person on Sharper's Head: the light should, therefore, never be brought to the southward of S.W. by S. It may also be remarked, that in running from the northward during the night, a light at Berwick Hill Colliery is sometimes perceptible, and some caution is therefore necessary not to mistake it for Berwick pier light.

"The lighthouse on Berwick pier must be brought to bear N.W. by W. $\frac{1}{4}$ W., when the entrance of the harbour is to be attempted; and previous to such attempt, the time and set of the tide must be duly considered.

"The sands at the mouth of the Tweed shift so frequently, that permanent marks cannot be given, and the pilots are obliged to examine and sound the entrance after every gale. Nevertheless it may be useful to know, that, in general, Tweedmouth Church steeple kept in a line over the centre of the roof of a red-tiled house, situated directly to the eastward of the chancel window, bearing N.W. by W. $\frac{1}{4}$ W., will lead over the bar, and abreast of the lighthouse, at the distance of about $\frac{1}{2}$ of a cable. From thence a course should be made parallel with the pier, nearly as far as its inner elbow, but avoiding the *Crab Water Rock*, which is cleared to the west by keeping Berwick spire just open to the west of the King's bastion, near the flag-staff. The vessel must then steer to the S.W., till abreast of the Preventive mast on Spittal Point, when a course may be shaped along the beach on the western side, so as to round its curve till near the Carr Rock, where the best anchorage will be found.

"In approaching Berwick Harbour from the southward, Budle Hill signal-house must not be shut in with Emanuel Head, till the lighthouse on Berwick pier bears N.W. by W. $\frac{1}{4}$ W., in order to avoid the outer shoals; then steer for it till within 2 miles, but do not go nearer than 8 fathoms, till a pilot comes on board.

"During the night the Longstone light ought not to be brought to the eastward of S.S.E., nor the Farn high light to the eastward of south, till Berwick light shall have been brought to bear N.W. $\frac{1}{4}$ W.

"During westerly winds vessels may anchor in the offing till the tide serves for entering the harbour, in the following positions:—In the inner stopping-place, in 4 fathoms at low water, on a sandy bottom, with the Old Bell Tower in a line with the house at the west end of the pier, N. by W. $\frac{1}{4}$ W., and Fair Steeds in a line with the Bear's Head Rock; Berwick light will then bear N. $\frac{3}{4}$ W., about $\frac{1}{4}$ a mile, and Hud's Head S.W. by W. Or they may bring-up in the outer stopping-place, in 8 $\frac{1}{2}$ fathoms, on a sandy bottom, with Berwick spire in a line with the lighthouse N.W. $\frac{1}{4}$ N. (the latter distant a mile); and Fair Steeds halfway between the Fishing Shiel on the bank side, and the Bear's Head."*

From BERWICK to ST. ABB'S HEAD.—About a mile to the northward of Berwick is Bottleness, a point, with a *reef* stretching from it to seaward about 2 cables' length, and partly above water. From hence to Whapness, the course is N. $\frac{1}{4}$ W., about 2 leagues. On the west side of Whapness is Aymouth, or Eyemouth. The land between Berwick and Eyemouth is called the Highland of Ross, and has a remarkable long and regular high appearance. Whapness is a low rocky point, with a beacon and high land behind it. Eyemouth is a tide-haven, and, like Berwick, subject to the freshes, which must be carefully guarded against. From Whapness to the opposite side of the bay, a high rocky steep point, with a fort upon it, is distant only $\frac{1}{4}$ of a mile; but a little outside, and directly in the fairway, are several *rocks* above water, dividing it into two channels. To sail into Eyemouth, you must keep in the midway of one of these channels, as best suits the prevailing wind; and when you are well within them,

* The following is an extract of a letter received at Lloyd's, from their agent at Berwick, the perusal of which will be found of importance to all mariners.—"It cannot be too generally known, that there is always a risk in taking Berwick Harbour with a strong wind from the north, particularly if there is a roll of the sea, and a fresh in the river—for, as soon as vessels turn in round the pier-head, they are apt to lose the wind and steerage way; and should they not borrow close to the pier, and immediately let go an anchor, there is every chance of their being drifted on to Spittal Point."

steer close to the beacon fixed on the port or larboard side rocks, and then run into the harbour: but be guarded against the freshes. Great quantities of fish are cured at this place, and many vessels take in grain.

EYEMOUTH HARBOUR LIGHTS.—These lights have been recently erected, for the benefit of the fishermen frequenting the Port of Eyemouth during the herring season. The brightest of the two lights is erected on a post, about 26 feet from the ground, and is seen at a distance of more than 6 miles. The smaller light is placed at the pier-head; and whilst it indicates the entrance to the harbour, it is in such a position relative to the other light, as to afford a leading-mark, when the lights are brought in one line, for the best passage into Eyemouth Bay. They will be found useful, not only to vessels trading with Eyemouth, but sailing along the coast, by distinctly informing them where they are, and enabling them, if necessary, to run at night into the bay for shelter.

At $\frac{1}{2}$ a mile N.W. of Eyemouth, vessels may anchor in a small spot under the high cliff, about $\frac{1}{4}$ of a mile from shore, in 14 or 16 fathoms; but this place will be rather difficult for a stranger to find.

From Bottleness to St. Abb's Head the course is nearly N. $\frac{1}{2}$ W., distant 3 leagues, and the shore generally foul and rocky, with 20 and 22 fathoms close to it, and 30 fathoms farther off; therefore, as you advance towards the Head, it will be requisite to give Bottleness a good berth; and you may then steer on for St. Abb's Head without danger.

ST. ABB'S HEAD, whether in approaching it from the southward or northward, first appears like an island. It is a high and remarkable promontory, and will be easily distinguished.

TIDES.—On the full and change days of the moon it is high water at Scarborough, at 4h. 15m.; at Whitby, 3h. 45m.; at the mouth of the Tees and at Hartlepool, 3h. 30m.; at Sunderland, 3h. 15m.; at Tynemouth Bar, 3h.; at Blythe and Coquet Island, 2h. 45m.; at Farn Island, 2h. 40m.; at Holy Island Harbour, 2h. 30m.; at the Longstone, 2h. 41m.; at Berwick and Eyemouth, 2h. 18m. The tide rises at Scarborough, 14 feet springs, 8 feet neaps; at Whitby, 15 feet springs, 10 feet neaps; at the mouth of the Tees, 16 feet springs, 10 feet neaps; at Hartlepool, 18 feet springs, 10 feet neaps; at Sunderland, 14 feet springs, 9 feet neaps; at Tynemouth, 15 feet springs, 8 feet neaps; at Blythe, 13 feet springs, 7 feet neaps; at Coquet Island, 15 feet springs, 9 and 10 feet neaps; at Farn Island, 16 $\frac{1}{2}$ feet springs, 9 feet neaps; at Holy Island Harbour, 16 feet springs, 11 feet neaps; at Berwick and Eyemouth, 15 feet springs, 10 feet neaps.

The stream of flood sets to the southward from St. Abb's Head, past Eyemouth and Berwick, towards Emanuel Head, continuing to run, at the distance of about 2 miles from land, 2 hours after the time of high water on the shore: this tide runs at the rate of from 1 to 1 $\frac{1}{2}$ mile an hour, parallel to the shore, all the way to Emanuel Head. At Emanuel Head its strength increases; and it sets along the Holy Island shore, towards Bamborough Castle, at the rate of 3 knots with spring-tides. From the bar of Holy Island, the flood sets strongly into the harbour; but outside of the bar, it sets towards Warnham. Between Emanuel Head and the Longstone, the flood sets for the inside of Farn Island; but near the Longstone, for the passage between the Staples and Farn Islands, where it runs with great rapidity. Vessels passing near should attend to this, that they may not be drawn in with it, in light winds.

Between the Megstone and the main, the flood runs parallel to the shore, increasing in strength until between Farn Island and Islestone, where spring-tides run nearly five knots; and with southerly or S.E. winds make a frightful sea, appearing like breakers. The streams of both flood and ebb are necessarily driven out of their respective courses, on the approach to the islands, or other obstructions, by which they will be occasionally retarded or accelerated: thus the tide will be divided as it approaches towards the Wamses, part of the stream being forced between the Farn and Staples, and also between the Farn and Wide Open; while that portion of the water which is not affected by those channels, runs between the Megstone and the N.W. point of the Farn Island. Here this point drives the water towards the main land, forming a curve, extending sometimes halfway between the island and the main; but increasing and decreasing, according to the velocity of the stream, which will be affected by the spring and neap-tides, by gales of wind, &c. The Islestone Rocks also much interrupt the

course of the in-shore stream, forcing the water to the eastward, where spring-tides run 5 miles an hour. The outer part of the stream of flood is forced to the eastward, from the north part of the Wamses, running through the openings, among the rocky islands which lie between the Wamses and the Longstone. These openings mostly become dry about half-ebb; but the water that does not pass through these openings sets easterly, until it has passed the north point of the Longstone; when, being joined by the main tide, it rushes rapidly between the Longstone and Knavestone, and again resumes its southerly course. When abreast of Sunderland Point, the whole body of the stream appears to re-unite; and, recovering the interruption occasioned by the various impediments, pursues its coastwise direction to the southward.

On the south side of the Farn Islands and the Scare Crows, between the streams of the two passages, there is an eddy during the flood, where, with a contrary wind, a vessel may turn, or anchor in 10 or 12 fathoms water, on clean sand, till the tide changes. There is, however, a considerable and rapid stream between the Wide Open and the Farn, which continues an hour after the flood has made; and this, in turning, must be particularly attended to.

There is necessarily an eddy on the south side of all the islands, during the flood, and on their north sides during the ebb; but about an hour after the flood has made, streams, of considerable force, come through the openings of all the rocky flats, many of which become covered about that time. Wherever there is an eddy, it causes a rippling, like broken water passing over shoals; and when the wind is in an opposite direction to the tide, it has a visible effect all round the islands; and on the south side of the Farn, with the flood eddy, the sea, with S.E. gales, breaks with great violence.

The **EBB-TIDE**.—The in-shore part of the ebb sets from Sunderland Point for the inner part of the Farn Island; and the outer part towards the passage between the Farn and Staples. As it approaches the islands, it is divided by the south point of the Wide Open, part running into the channel between the Farn and Staples, and between the Farn and Wide Open; and part flowing towards the S.W. part of the Farn; where, curving to the westward, it winds again into the passage between the Farn and Megstone, and between the Megstone and Ox Scar, the in-shore part passing along the coast, and between the Megstone and the main.

At the point of Staples Island the ebb also divides near the Pinnacles, part running between the Farn and Staples, and the other taking an easterly direction from the Pinnacles towards the Longstone; then passing the south end of the Longstone, it joins the main tide, and runs through between the Longstone and Knavestone. Close to the Longstone there will be an eddy, caused by the velocity of the water passing its southern point.

About 5 leagues off the Staples, the flood-stream runs to the southward, till 5h. 45m.; and at about 8 or 9 leagues off Coquet Island, it runs till 6 o'clock. Off Whitby the flood-stream continues to run till 6h. 30m.; and off Flamborough Head till a quarter past 7 o'clock.

In the offing, at 4 miles from the land, the stream runs full 3 hours after it is flood on the shores. Gales of wind, from between W.S.W. and N.W., raise the tides higher, and occasion the flood to run longer; while easterly and S.E. winds have an opposite effect.

FROM ST. ABB'S HEAD TO BUCHAN NESS.

Description of the Land, &c.

FROM ST. ABB'S HEAD to FIFE NESS, including the FRITH OF FORTH, commonly called EDINBURGH FRITH.

ST. ABB'S HEAD takes its name from a chapel there situated, and is a lofty promontory, or headland, steep-to, and making like an island. The adjacent shore is rocky and cliffy, and the tide runs by it with a strong current, the least wind making a heavy

sea. Close to its point is deep water; and a little from it are 30 and 40 fathoms. It is in latitude $55^{\circ} 55' 30''$ north, and longitude $2^{\circ} 8'$ west.

N.W., 3 miles from St. Abb's Head, is Fast, or Fal's Castle, in ruins, standing upon a ragged rocky point of land, called Lumsden Head. The coast between St. Abb's Head and Fast Castle is all steep, with high cliffs, which continue considerably farther to the westward, then fall down to low land so far as Dunbar, the whole being *foul* and *rocky*.

DUNBAR.—The course and distance from St. Abb's Head to Dunbar, are N.W. $\frac{1}{2}$ N., $13\frac{1}{2}$ miles. This town is situated within a low rocky point: it is a pier-harbour, the bottom being of solid rock. On the west side of the harbour are the *Staple Rocks*, some of which are always visible, having deep water close to them. Vessels may anchor about a mile off Dunbar, in 7 or 8 fathoms water; but the customary roadstead is directly abreast of the piers, in 10 or 12 fathoms, sandy ground. The entrance between the piers is narrow; and when there is any kind of breeze, it brings with it a rolling sea; so that, unless in easy weather, to sail into the harbour becomes difficult and dangerous.*

At $2\frac{1}{2}$ miles N.W. from Dunbar, is Whitberry Ness, a low downy point, with a nob upon it, called Baldrin's Cradle. Between there is a deep sandy bight, leading to Tynningham River: it is filled with *shoals*, and called *Tynningham Flats*, drying to a considerable distance off, so that it must have a good berth in passing.

THE BASS is a remarkable *rock*, situated on the southern side of the entrance to the Frith of Forth. It is almost a mile in circumference, high, round, steep on all sides, and of a white appearance, occasioned by the dung of innumerable birds which resort there. Close to its sides are 15 fathoms, and about a mile off it 23 fathoms. The passage between it and the shore is full a mile wide. The ground is rocky; but there is a depth of from 9 to 12 fathoms within it. The Bass Rock lies N.W. by N., 19 miles from St. Abb's Head; N. by W. $\frac{3}{4}$ W., 6 miles from Dunbar; and S.W. $\frac{3}{4}$ S., 12 miles from Fife Ness.

Two miles N. by W. $\frac{1}{2}$ W. from Whitberry Ness is the point of Scougall, or Seaclyff; between these are the sandy flats already mentioned. A *reef of rocks* stretches off the point, called the *South Carrs*, and the coast hereabout is steep, rocky, and foul; the South Carrs are dangerous, stretching out full $\frac{1}{2}$ a mile from the point, chiefly drying at low water. They lie about $4\frac{1}{2}$ miles N.N.W. from Dunbar, and a mile to the eastward of Tamtalan—an old fort in ruins. The Carrs are steep-to, having 7 fathoms on their outer side. During the flood-tide, a strong indraught sets over them towards the flats, which, with N.E. winds, has rendered them fatal to many ships; the mariner should, therefore, be particularly careful in passing them. A beacon, of masonry, has been lately erected on the South Carr Rocks, having a large cross at the top of it.

NORTH BERWICK.—From the Carrs to North Berwick, the shore continues *foul* and *rocky* full a cable's length from the land. W. $\frac{1}{2}$ N., about $1\frac{1}{2}$ mile from the Bass, and nearly $\frac{1}{2}$ a mile from the shore, is the *Stub Rock*. Inland, about $\frac{3}{4}$ of a mile from the town, is a round hill, called North Berwick Law, which is remarkable, and serves to distinguish this part of the coast. On the western side of North Berwick are some *rocks*, lying above $\frac{1}{2}$ a mile from the shore, some of them being always above water.

CRAIG LEITH is a round *rocky* islet, steep on all sides, about a mile from the shore. It lies W.N.W., $2\frac{3}{4}$ miles from the Bass Rock, and has a good passage between it and Berwick Rocks.

LAMB ISLAND lies about a mile to the westward of Craig Leith, and is much nearer the shore. There is deep water between them; but towards the shore it is *foul* and *rocky*.

FIDRA is a *black rugged rock*, having a hole through it, of singular appearance, and lies N.W. by W. from Lamb Island, distant a mile; and W.N.W. from Craig Leith, distant 2 miles. The ground all round it is *foul* and *rocky*; and the *Bridge*, a long

* *Dunbar, July 21st, 1844.*—The new harbour is going on very rapidly. There is not above 100 feet of the breakwater to finish; and we expect this will be done in a month. We shall have 17 to 18 feet at the north pier, and the same at the entrance, which is sought to get deepened to the extent of 21 to 22 feet for about 200 feet.

[NORTH SEA.]

reef running from it towards the shore, affords not even a passage for boats. These rocks dry at low water.

The **IBRIS** is another *dark-looking rock*, lying to the westward of Fidra, distant about a mile, being nearly $\frac{1}{2}$ a mile from the shore, to which it is joined by shoal water, so as to prevent any passage between. It is *foul* on the outside. About $\frac{1}{2}$ a mile to the northward of these rocks, are 10, 12, and 14 fathoms; and farther off, in the Frith, are 24 and 26 fathoms. May Island lies towards the opposite side; but as it forms a conspicuous object for the entrance into the Frith, we give a description of it here:—

MAY ISLAND lies 7 miles N.E. $\frac{1}{2}$ E. from the Bass; N. by W., $20\frac{1}{2}$ miles from St. Abb's Head; N. by E. $\frac{3}{4}$ E., $10\frac{1}{2}$ miles from Dunbar; and S. by W. $\frac{1}{2}$ W., $5\frac{1}{2}$ miles from Fife Ness. This island is nearly a mile in length, rocky, but steep-to all round, except towards its northern part, which shoals at low water full $\frac{1}{2}$ a cable's length out.

On this island a lighthouse has been erected, in latitude $56^{\circ} 11'$ north, and longitude $2^{\circ} 33'$ west, contiguous to the old lighthouse tower, on the highest part of the island. It is built of stone, and is 57 feet in height from the base to the lantern, which is elevated 240 feet above the level of high water, at spring-tides. The present light is from oil, with reflectors, known to mariners as a bright fixed light; which, being defended from the weather in a glazed light-room, has an uniform steady appearance, resembling a star of the first magnitude; and may be seen from all points of the compass, at the distance of about 7 leagues; and at all intermediate distances, according to the state of the atmosphere. Between this island and the Bass, the depth is about 25 fathoms mid-channel; and between it and the Fife shore, 14 to 20 fathoms.

A new lighthouse has been erected on May Island, as a guide for the North Carr Rock, and was first lighted on the 15th of April, 1844. This leading-light is fixed, and of the natural appearance, and is placed on a tower, about 130 feet below the level of the present light, and to the N.E. by N. of it. The lights will be seen distinctly separate, the one above the other; and when in one line, they bear S.W. by S. $\frac{1}{4}$ S. and N.E. by N. $\frac{1}{4}$ N., and lead about $\frac{1}{2}$ a mile to the eastward of the North Carr Rock. The light must on no account be opened to the westward.

ABERLADY.—W.S.W. $\frac{1}{2}$ W. from Ibris, distant $2\frac{1}{2}$ miles, is Gullan Ness. Between Ibris and Gullan Ness the shore is sandy and flat; but Gullan Ness Point is *rocky*; and a *bank* runs from hence along shore, all the way to Leith. The space to the westward of Gullan Ness, is commonly called Aberlady Bay. About 2 miles to the northward of Aberlady Bay, the soundings are $5\frac{1}{2}$ to 6 fathoms, the depth decreasing as you approach the shore: bottom sand and shells. A mile beyond Gullan Ness, is Haddington Port, running to Aberlady and Luff Ness. At 4 miles from Aberlady is Cockenzie; and a mile beyond that is Preston Pans. The coast then runs in nearly a W. $\frac{1}{2}$ N. direction to the River Esk, and thence N.W. $\frac{3}{4}$ N. to Leith, the whole having a *sandy flat* stretching out in some places a full mile from the shore. From Leith a similar *sandy flat* continues running in a N.W. direction to Cramond Island.

INCH KEITH is a small island, situated nearly in the middle of the Frith, between Leith and Kinghorn Ness, $\frac{3}{4}$ of a mile long, and narrow, lying nearly north and south. On the highest part of it, near the north end, are the ruins of a fort; and near the middle of it is a lighthouse. Off its south end is a narrow *black rock*, always above water, called *Lang Craig*. From thence a *reef of rocks*, called the *Brigs*, which are seen only at spring-ebbs, extends S. by E. $\frac{1}{4}$ E., $\frac{1}{2}$ a mile, separated only by a narrow channel, of 10 or 12 feet at low water. The east end of this island is steep-to; but a *black rock* off the N.W. point of the island has a *reef*, stretching 2 ships' length from it to the westward. The western side is also foul, many of the rocks being visible at low water.

Inch Keith lighthouse has a revolving light, without colour; and, by a new apparatus, it produces bright flashes once every minute. In clear weather the light is not totally eclipsed between the flashes, at a distance of 4 or 5 miles. The lantern is elevated 220 feet above the level of the sea, and may be seen from all points of the compass. By this alteration of the light upon Inch Keith, the present character and description of the other lights upon the coast near the entrance of the Frith of Forth is preserved, and the possibility of mistaking Inch Keith light for any of the other lights of the Frith of Forth, is effectually prevented.

From Inch Keith lighthouse, Elie Ness bears E. by N., distant $14\frac{1}{2}$ miles; May

Island light east, $21\frac{1}{2}$ miles; Fidra E.S.E. $\frac{1}{2}$ E., 12 miles; Leith pier-light, S.W. $\frac{1}{2}$ W., $3\frac{1}{2}$ imles.

The HERWIT.—To the southward of the Brigs of Inch Keith, is the Herwit, another reef, seen at spring-ebbs, which stretches S.E. by S., nearly $\frac{1}{2}$ a mile from the Brigs. Between these is a channel, of 3 fathoms at low water; and close to the outer point of the Herwit, on which a black buoy is placed, are nearly 15 fathoms water, which shoals off to the southward.

The NORTH CRAIG lies nearly in the middle of the south channel to Leith, and consists of *craggy rocks*. It is about a cable's length from east to west; but not so much from north to south. Over it are $3\frac{1}{2}$ fathoms at low water. A pyramidal, or mast buoy, is placed on it, chequered red-and-white. This rock lies about $2\frac{1}{2}$ miles S.E. $\frac{1}{2}$ S. from Inch Keith lighthouse, its marks being, Lord Nelson's monument, on Calton Hill, on with the west part of the easternmost house on the beach, east of the glass-houses, bearing W.S.W. $\frac{1}{2}$ W.; the buoy of the Craigwaugh S.W. $\frac{1}{2}$ W.; and the buoy of the Herwit N.W. by W. $\frac{1}{2}$ W.

The CRAIGWAUGH is a small round rock, lying S.S.E., distant $1\frac{1}{2}$ mile from the Herwit, and 2 miles in the same direction from the Lang Craig. It appears about a ship's length over; and the weeds upon it are always visible. On its northern end is a red buoy. These three buoys mark the boundary of the south channel to Leith.

The GUNNET lies W. $\frac{1}{2}$ N., $1\frac{1}{2}$ mile from the Inch Keith lighthouse, and is formed of two rocks, joining each other, having a white buoy at each end: over them are 9 and 10 fath water.

The FALIAS is a small rock, with 10 feet water over it at spring-ebbs, lying above $\frac{2}{3}$ of a mile W. by S. from Inch Keith lighthouse. From it St. Andrew's Church spire appears on with the east end of Edinburgh Castle, bearing S.W.; and the Gunnet buoy and Mickry Stone in one, bearing W.N.W. $\frac{1}{2}$ W. There is a chequered buoy upon it.

The MICKRY STONE is a high black rock, surrounded by some smaller ones, lying between Mickry Island and the Ox Scars.

MICKRY ISLAND is small and rocky, lying nearly W. by N., distant $4\frac{1}{2}$ miles from Inch Keith lighthouse; N.W. $\frac{1}{2}$ N., $3\frac{1}{2}$ miles from the Martello tower at the entrance of Leith; and S. $\frac{3}{4}$ E., $1\frac{1}{2}$ mile from the east end of Inchcolm. Between Mickry Stone and Mickry Island, is $1\frac{1}{2}$ fathom water.*

The OX SCARS are a collection of rocks, partly visible at 4 hours' ebb. They bear from the east end of Inchcolm about S.S.E., distant $\frac{3}{4}$ of a mile, and are directly in the fairway. Their northern side is now pointed out by a beacon. From the beacon a narrow bank, with $3\frac{1}{2}$ to 4 fathoms on it, runs to the eastward, $1\frac{1}{2}$ mile. In the channel between them and Inchcolm, are 22 fathoms.

INCHCOLM is a narrow island, lying west from Petticur light, distant $4\frac{1}{2}$ miles; and W.N.W., $5\frac{1}{4}$ miles from the northern end of Inch Keith. On its eastern end is the ruins of an old monastery; and above $\frac{1}{2}$ of a mile from its eastern point, to the eastward, is the *Car Craig*, a high round rock, steep-to on its south and eastern sides. The *Haystack* is another lofty rock, lying to the N.W. by W. $\frac{1}{2}$ W. of Inchcolm, distant about $\frac{1}{2}$ a mile.

CRAMOND is a small island, of green appearance, lying nearly S.W. by W. $\frac{1}{2}$ W., distant a mile from Mickry Island: and S.W. by W., $\frac{3}{4}$ of a mile from Cramond Island, is Cramond Town, situated at the entrance of the River Almond. The sand here, called the *Drum Sand*, dries a full mile out, stretching along the shore from Granton to Hound Point. Barnbug Hall is a large white building, standing near the sea side:

* *Sunken Rocks off Inch Mickry.*—As serious accidents, with loss of life, have frequently happened on the sunken rocks in this neighbourhood, during dark weather, those best acquainted with the subject, say that lights ought to be placed on proper points, to guide them through this dangerous part, and to warn all vessels of their danger, when driven this way by stress of weather. There is, indeed, a beacon (but without a light) on the rocks called the Ox Scars, not very far distant; but it is of little use, except in day-light: and as for the light on Inch Keith (nearly 5 miles off), it is considered altogether insufficient, unless in clear weather.—*Shipping Gazette, September 26th, 1844.*

Edinburgh, 24th January, 1840.—The *City of Edinburgh Oyster Scalps* have been marked off by four large buoys, chequered black-and-white.

The northern boundary extends from the Mickry Stone, to $1\frac{1}{2}$ mile to the eastward of Inch Keith, where a buoy is laid down in 5 fathoms, low water, Inch Keith lighthouse bearing N.W. by W.

This boundary line is marked off by a buoy, half distance between Mickry Stone and Inch Keith, in a direct line with the Gunnet and Pallas buoys, lying in 5 fathoms at low water.

The S.E. boundary is marked by a post on the shore, and a buoy, which lies in $5\frac{1}{2}$ fathoms at low water, Inch Keith lighthouse N. $\frac{1}{4}$ E., distant 2 miles.

The S.W. boundary is marked by a post on the shore, and a buoy, lying in 4 fathoms at low water, Mickry Stone bearing N. by W. $\frac{1}{2}$ W., distant $1\frac{1}{4}$ mile.

We are also informed, that the navigation of the Frith is buoyed and beaconed up to Alos; the particulars of which we shall make public when obtained.

ENTRANCE TO LEITH.—On Leith Sands, to the eastward of the pier, lie the *Leith Craigs*, visible at half-ebb. Near the outer end of the sands, N. by E., nearly $\frac{1}{2}$ of a mile from the pier-head, and N.W. from Leith Craigs, lie the *Beacon Rocks*: these appear at two-thirds ebb, and have a Martello tower erected upon them. Directly N. $\frac{1}{2}$ W. from the Craigs, is *Symonds Reef*, with only 3 or 4 feet water over it, extending to the distance of 2 ships' length. Mickry Island on with a deep-cut notch in the land over Inverkeithing, will lead clear of the outer point of the Symonds. The tide here ebbs out full $\frac{3}{4}$ of a mile from the shore; but the edge of the bank is steep-to.

There are two harbour-lights exhibited on the eastern pier of Leith, which are lighted every night from half-flood to half-ebb, or while there are 10 feet water over the bar. In day-time a train of signals is adopted, communicating the rise of tide to the pilots, and commencing when there are 10 feet water over the bar.

LEITH HARBOUR has been lately much improved. A new pier is now run out, 1500 feet from the point of the old one, by means of which, vessels get into smooth water in easterly gales, where it is considerably deeper than formerly. From the point of this new pier a wear is constructed, which extends about 1200 feet seaward, terminating about 200 yards to the westward of the Martello tower. Buoys are laid along the line of this wear, which are to be kept on the port or larboard hand in entering the harbour.

A western pier, or breakwater, has been also built, extending from the western basin of the docks, to meet the eastern pier, at about 100 feet from its extremity; but stopping, and leaving an entrance of 250 feet. By the breakwater, the harbour is sheltered from northerly winds.

The harbour has gained considerably in depth, in consequence of the improvements. The average depth at high water, spring-tides, is 17 feet; and at neaps, 13 feet in the fairway. At the new pier-head there is full a foot more.

The depth in the fairway is indicated by signals from the old pier-head lighthouse, commencing with a ball when there are 10 feet; and at night, the light is shown only while there is that depth, or upwards. There is a small red light at the extremity of the new pier, which, being kept open a little to the left of the bright light, leads into the harbour, mid-channel, and close to the white, or fairway buoy.

While the entrance-gates to the docks are open for the admission of vessels, a red flag, with a white ball in the centre, is exhibited from a building on the west side of the harbour.

At Newhaven, west of Leith, a stone pier runs out, from which the sand dries to the eastward so far as the Martello tower. Here a small fixed light is exhibited on the pier, of a red colour; but only shown when the passage-boats ply in the night: it, however, may be seen 2 or 3 miles off. To the westward of Newhaven is a chain-pier, used chiefly by the coasting-steamers, which also exhibits a red light at night. Granton pier, built at the expense of the Duke of Buccleugh, is about a mile west of Newhaven. It is 1700 feet in length, and 80 in breadth. During the night, a red light is shown from the end of the pier.

Vessels may anchor off Newhaven with Hound Point open midway between Cramond Island and Mickry Stone, in $5\frac{1}{2}$ fathoms at low water; or with Edinburgh Castle open

to the westward of Newhaven, and Barnbug Hall (which, as before observed, is white, and stands by itself on the south shore), open to the northward of Cramond Island, in 5 fathoms at low water. Large ships should anchor with the white house a ship's length open of Cramond Island. The ground is reckoned good. To the eastward of the road is a *ledge of rocks*, which must be left on the port or larboard hand in going to Leith Harbour. A beacon is on its outer end, and it is dry at low water. Two miles beyond Barnbug Hall, is Queen's Ferry, where a light is usually shown in dark weather, for the convenience of landing passengers from the steamers.

NORTH SIDE OF THE FRITH.—Kinghorn Ness lies about 2 miles N. by W. from Inch Keith. The shore is steep and rocky, with 22 and 20 fathoms about a mile from the former. To the westward of the Ness is Petticur, or Kinghorn Harbour. On the eastern pier is a white lighthouse, bearing a bright fixed light, while there are 8 feet water in the harbour; it may be seen 6 or 7 miles off, when the weather is not foggy, from S.E. by S., seaward, to W.S.W.

From Petticur to the southward, $\frac{1}{2}$ of a mile over towards Inch Keith, a *rocky flat* extends, called the *Blea*, with 2 $\frac{1}{2}$ fathoms on it at low ebbs; the tide runs with great rapidity across it, and makes a strong rippling.

Burnt Island lies about 2 miles W.N.W. $\frac{1}{2}$ W. from Petticur pier. Between them is a *sandy flat*, drying at low water, with 9 and 10 fathoms near its southern edge. Between it and the Gunnet are 18 and 22 fathoms mid-channel; and a similar depth continues up channel as far as Inchcolm. Burnt Island Harbour is a good place for vessels when bound to the southward; for they may proceed from hence, when they cannot get from Leith Roads with a northerly wind. There is no danger in entering, unless you run against the piers; keep in the middle between them, and have an anchor ready to let go. By thus keeping the piers open, you will avoid the rocks to the eastward of the harbour. When in, you will ride over a bottom of sand, which dries at low water. The shore at Burnt Island is steep-to, and continues so toward Stanley Burn. On the eastern pier there is a harbour light, shown throughout the night; the building is white, and the lantern 20 feet above the level of the sea, visible from S.E. by E., seaward, to W. by S., to the distance of 7 miles.

Stanley Burn is a good watering-place, and has a small pier. The road of Burnt Island lies between Stanley Burn pier and the island, and has from 3 fathoms, near the shore, to 13 and 14 fathoms farther out, deepening gradually, with a bottom of clay and mud. Good anchorage may be found a little westward of the pier, about $\frac{1}{2}$ a mile from the shore, in 6 or 7 fathoms; but be careful not to anchor too far to the westward, lest you get too near the Commons Reef.

The reef, called the *Commons*, runs out from the western shore at Stanley Burn, full $\frac{1}{2}$ a mile from the shore, and must be carefully avoided. From the Commons to abreast of Carr Craig and Inchcolm, the shore is *foul and rocky*. W.N.W., nearly 2 miles from the west end of Inchcolm, is the *Doig Rock*. It is about 3 cables' length from the shore, with 3 feet over it. The marks for it are, the Haystack on with the northern part of Inchcolm, and the middle of Inch Garvy, on with the eastern houses of Queen's Ferry.

Inch Garvy is a narrow circular island, lying mid-channel between North Ferry and the opposite shore, having deep water, and a passage on each side. N.W. $\frac{1}{2}$ N. from Inch Garvy, $\frac{1}{2}$ a mile, is *Mackintosh's Rock*, with only 8 feet water over it. It lies about a cable's length from Lang Craig, with from 3 to 5 fathoms between them. On its southern side are 17 fathoms, and farther off it 30 fathoms. The mark for this rock is, the Bimer, on with the west corner of the wood at the west side of Hopetown House. This is situated a little to the westward of the Society's House, opposite to Dove Craig, and is surrounded with trees.

The *Bimer* is a rock, above water, to the westward of Mackintosh's Rock, steep all round, with 30 fathoms off its southern side. A beacon, of masonry, has lately been erected on Bimer Rock. To the north-eastward of the Bimer are the *Lang Craig Rocks*, close in shore; but between the Bimer and Lang Craig are 10 fathoms. Two miles to the north-westward of North Ferry, and $\frac{1}{2}$ a mile from the shore, is Dove Craig, a little island, with a *sandy flat* extending from it about a cable's length.

From Kinghorn Ness, along the north shore of the Frith of Forth, to Fife Ness.

About 2 miles N.E. $\frac{1}{2}$ E. from Kinghorn Ness, is the bay of Kirkcaldy. One mile from Kinghorn town is Seafield Castle, or Tower, in ruins; abreast of which, some pointed rocks run out $\frac{1}{2}$ of a mile, called the *Vows*; some of these are above and some under water. There are $4\frac{1}{2}$ fathoms close to their southern sides. The coast from Kinghorn Ness to the Vows is much encumbered with rocks, being steep-to.

Kirkcaldy Bay is clean, in from 11 to 6 fathoms water; and so is the coast thence so far as Largo Bay, if you keep within the above depth, but otherwise the ground is foul. A little to the eastward of Dysart is Ravensheugh, a small tide haven, to the south-eastward of which, and nearly $\frac{1}{2}$ a mile from the nearest shore, is *Dysart*, or *Ravensheugh Rock*, about 20 fathoms in length, with 8 feet water on it at low ebbs, and 3 fathoms close to it. Nearly $\frac{3}{4}$ of a mile north-eastward of the latter rock is the *East Rock Head*, being nearly $\frac{1}{2}$ of a mile from the shore, with only 6 feet on it at low water. Its marks are, the ruins at West Wemys on with the ruins of the castle at East Wemys. The thwart-mark is, the old mill at Dysart, seen over the engine brae. By keeping out in 7 fathoms, you will avoid both the latter rocks. Farther on are West and East Wemys, Buckhaven, Methel, and Leven, all tide-havens, and places of small note. The latter is distant 10 miles N.E. by E. $\frac{3}{4}$ E. from Kinghorn Ness. From Dysart to Leven, the shore is rocky throughout, and foul a full cable's length off.

LARGO BAY is that space between Leven and Ruddon's Point, the land there forming a considerable concavity. Ruddon's Point lies S.E. by E. $\frac{1}{2}$ E. from the entrance of Leven River, distant 4 miles. The anchorage in the bay is good, in from 6 to 10 fathoms; the bottom sand and shells, except on the N.E. side, where it is somewhat foul.

To the eastward, $2\frac{1}{2}$ miles from Ruddon's Point, is Elie Ness, a conspicuous promontory; and between these are *two rocks*, called the *East and West Vows*, visible at half tide, and have from 4 to 5 fathoms near them. There is also another *small rock*, a short distance to the eastward of the Vows, called the *Shell Rock*, which appears at low ebb. Here are the town and harbour of Elie, a tide-haven, with a pier, or landing-place, considered tolerably good, and much frequented. It lies within the first point to the N.W. of Elie Ness.

Elie Ness lies E. $\frac{1}{2}$ N., 14 miles from Kinghorn Ness; N. by W., $8\frac{1}{2}$ miles from the Bass Rock; and N.W. by W. $\frac{1}{2}$ W., $8\frac{1}{2}$ miles from May Island lighthouse. Chapel Ness lies $\frac{3}{4}$ of a mile westward from Elie, and Kingeraig Ness N.W. $\frac{1}{2}$ W., a mile from Chapel Ness. *Kingeraig Ness* is a *rocky point*, and foul some distance off; over these points (Chapel Ness and Kingeraig Ness), is seen the Heugh, a remarkable object, being a high green bank near the shore, and visible even by night.

The shore from Elie Ness to Fife Ness is generally rocky and foul. About a mile from the latter is a *sunken rock*, called the *Ox*. It lies about $\frac{1}{2}$ a mile from the land, and dries at spring-tides. Keep Kinghorn Ness open of Elie Ness, and you will go clear to the southward of it. On the shore are the small tide havens of St. Monance, Pittenweem, and Anstruther. We have already said, the shore is rocky and foul a cable's length out or more, but particularly at Billy Ness, near the west side of Anstruther; be careful, therefore, not to come too near, for there is deep water all along. There is a beacon on the shore $\frac{1}{2}$ a mile eastward of Anstruther.

At $3\frac{3}{4}$ miles to the E.N.-eastward of Billy Ness is the town and tide-haven of Crail; and farther on, about 2 miles, is Fife Ness, the north-eastern point of entrance to the Frith of Forth.

FIFE NESS, in latitude $56^{\circ} 17'$ north, and longitude $2^{\circ} 35'$ west, is steep-to on its southern side; but W.S.W. from it, is a high black stone, called Kilmenie Craig, which forms a remarkable object. The shore between is foul a full cable's length off. N.E. $\frac{1}{2}$ E., a mile from Fife Ness, is the *North Carr*, a most dangerous ledge of rocks, stretching in the above direction about a mile; it dries at the last quarter ebb, and the outer rock appears to be about the size of a boat; being steep-to on its south and south-eastern sides, having 12 fathoms close to it; but with a *little reef* running out from it toward the north. To go clear to the southward of the North Carr, you should keep Kilmenie Craig in sight, and open of the land. To go to the eastward, keep Traprene

Law (a hill on the south side), its apparent breadth to the eastward of the Bass Rock. In the night, approach no nearer to it than 16 or 15 fathoms. The two lights on May Island in one, bearing S.W. by S. $\frac{1}{4}$ S., leads $\frac{1}{2}$ a mile eastward of the North Carr Rock. To clear it to the northward, bring either of the steeples in the town of St. Andrew's open of Babert Ness. The battlement of Crail steeple, kept in sight above the land, is also a good mark to clear it to the eastward. The Carr Rock bears from the Bell Rock S.W. by W. $\frac{1}{4}$ W., distant 10 miles, and from the Island of May lighthouse N.N.E., $6\frac{1}{2}$ miles. In 1822, a beacon was erected upon this rock, the lower part of which is a circular building, of masonry, measuring 18 feet in diameter, which forms a basement for six pillars of cast iron, terminating in a ball 3 feet in diameter, which is elevated about 25 feet above the medium level of the sea; the whole at half-tide appearing somewhat like a vessel under sail at the distance of 2 or 3 leagues. A buoy has also been placed to the eastward of the beacon. Mariners are warned, when they run for the Carr Rock beacon, to do so with caution, both on account of its exposure to the breach of the sea, and its liability to receive damage from vessels under sail.

DIRECTIONS FOR SAILING UP THE FRITH OF FORTH.

VESSELS coming from the North Sea for the Frith of Forth, in about the latitude of $56^{\circ} 12'$, which is nearly that of May Island lighthouse, will first perceive the high land about St. Abb's Head, which is lofty and regular; and the Cheviot Hills, which, in clear weather, may be seen 24 miles off, will also easily be recognized, by their appearing above all other hills to the southward of them. If making towards the coast of Fifeshire, the High Lomonds, Largo Law, Kelly Law, &c., will first appear, making unequal and detached heights, of conical forms, like the tops of sugar-loaves, long before the low land between them is visible.

If coming from the southward, you will probably see the round hill near Dunbar, making in appearance somewhat like the Bass Rock. Some navigators have mistaken it for the Bass Rock; but the North Berwick Law, seen to the northward of it, may always distinguish it from the Bass. If you intend going within the Bass, between it and the main, be careful to give the South Carrs a good berth; and when you have passed these Carrs, keep at a moderate distance from the shore, and go either inside or outside of Craig Leith; if the former, keep close to it, and stand out between it and Lamb Isle. The depths are various, and the ground near the shore rocky. The mark to go between the Bass Rock and the shore is Fidra, between Craig Leith and Lamb Isle.

To sail up the Frith outside, and to the northward of the Bass, is more customary and safe. In this case, you will steer from St. Abb's Head nearly N.W. by N., until you have passed the Bass, then W.N.W. to Inch Keith. The course to Inch Keith, from midway between the Bass and May Island, is W. by N., and from the south end of May Island W. $\frac{1}{4}$ N., about $21\frac{1}{2}$ miles. To sail from St. Abb's Head to the Bass Rock, keep the East Lomond on the Bass Rock. In the night, keep without the stream of 20 fathoms.

Midway between May Island and Fife Ness, the course to Inch Keith will be W. $\frac{1}{4}$ S.; but if close in with Fife Ness, steer W.S.W. $\frac{1}{4}$ W., 9 miles, or to abreast of Elie Ness, and from thence west, towards Inch Keith.

If ships turning to windward in the mouth of the Frith, take the first of flood close to the south shore, and keep the last of it on the north, they will have 7 hours' tide in their favour; for the stream continues to run south of Fife Ness $\frac{1}{2}$ an hour after it changes on the north side of May Island, and an hour after it has done flowing at the Bass.

In the night, when standing over to either shore, below Fidra and Elie Ness, approach no nearer than 20 or 18 fathoms; between Fidra and Gullan Ness no nearer than 14 or 12 fathoms; but west of Gullan Ness, you may stand into Aberlady Bay, to 8 or 7 fathoms.

In every part of Aberlady Bay the ground is clean and good. The usual marks for

the roadstead are, Gullan Ness E. by S., and Portseaton S.S.W., or S.W. by S.; and there is generally good anchorage on the south side of the Frith, in all parts, between Gullan Ness and Inch Keith, where there is a less depth than 8 fathoms, observing to avoid Craigwaugh and North Craig. There is also good anchorage in Largo Bay (the N.E. side excepted), with gravelly ground, in from 14 to 7 fathoms. The common marks are, Elie Ness E. by S., and Methel pier, N.N.W., in about 12 fathoms. With westerly winds, vessels may anchor off the east side of Inch Keith, in from 7 to 12 fathoms, soft ground.

The CHANNEL MOSTLY USED IN SAILING UP THE FRITH, is to the northward of Inch Keith. Large ships passing this way, must be careful to avoid the Blea, by keeping the remarkable point, called the Carlin's Nose, well open to the southward of Inchcolm. This mark should be kept on until you are nearly as far up as Burnt Island Church, that the *bank* which lies in the way, west of Petticur, may be avoided. The course and distance from abreast of Kinghorn Ness to abreast of Inchcolm, are W. $\frac{1}{2}$ N., about $4\frac{1}{2}$ miles. The water is deep, with hard rocky ground.

Burnt Island Road is a little to the westward of the pier. The marks are, the pier E.N.E., or the high land over Kinghorn open a little to the southward of the Black Rock east of Burnt Island, and Stanley Burn N.N.W. Here is good clayey ground, in from 9 to 12 fathoms; but be cautious of not going too near the Commons to the westward.

Vessels bound to the Roads of Leith, from the north side of Inch Keith, must give the Black Rock, which always appears above water, off the N.W. point of Inch Keith, a good berth. Thence they may steer to the southward, on either side of the Gunnet. The buoys will be a sufficient guide for avoiding the rocks; but should they be gone, keep North Berwick Law open to the northward of the Lang Craig, until Grange House opens to the westward of Burnt Island Church, when you will be clear of the rocks, and may steer to the southward. The mark for sailing between the Gunnet and Pallas Rocks, is Nelson's Monument on with Leith Martello tower, S.W. $\frac{1}{2}$ S.; and the mark for sailing to the westward of the Gunnet, is Nelson's Monument on with North Leith Church spire, S.S.W. $\frac{1}{2}$ W. In running over, in thick weather or in the night, by keeping the lead going, you may know when you are in the roads, by the water's deepening 1 or 2 fathoms. The instant that you find it shoal thence, drop your anchor, and be cautious not to get too far to the eastward, toward the Beacon Rocks and Symonds.

It has already been observed, that the Gunnet has a white buoy at each end, and the Pallas Rock a chequered buoy; therefore, in passing between them, you will leave the white buoy on your starboard side, and the chequered buoy on your port or larboard. A W.S.W. direction will then carry you to Leith Roads.

LEITH ROADS.—The MARKS for ANCHORAGE in the roads are, Barnbug Hall open to the northward of Cramond Island; and Edinburgh Castle a ship's length west of Newhaven, in 5 fathoms, muddy ground. Large ships should keep Barnbug Hall a ship's length open to the North of Cramond Island, for the deepest water lies in that direction.

CHANNELS TO THE SOUTHWARD OF INCH KEITH.—The channels to Leith Roads southward of Inch Keith, are also very good; the ground being generally soft, and the tide easy.

The black buoy on the Herwit, the pyramidal buoy on the North Craig, and the red buoy on the Craigwaugh, will be sufficient to point them out by day; and by night they must be avoided. The channel is nearly a mile wide. A leading-mark for sailing up the south channel, between the North Craig and Craigwaugh, is the highest part of North Berwick Law on with Rundel's summer-house, near Gullan Ness, bearing E.S.E. $\frac{1}{2}$ E. Keep these on, until Inch Garvy comes on Hound Point; then steer on in that direction, until Largo Law comes open of the N.W. point of Inch Keith, and you will be in the roads.

In sailing up the Frith, southward of the Craigwaugh Rock, stand into Aberlady Bay, until North Berwick Law comes on with the high land within Gullan Ness, taking care, at the same time, to keep the Law open to the northward of the notch on the south end of the high land. Continue with this mark on, until Inch Keith light bears N. by W.; then bring Barnbug Hall just touching the north point of Cramond Island, and it will lead into Leith Roads.

In turning, when within the North Craig, you may stand to the Herwit, until the westernmost glass-house at Leith comes nearly on with Edinburgh Castle; and to the Craigwaugh, until North Berwick Law comes within its own breadth of the notch before mentioned; and to the beacon rocks and Leith Craigs, until a remarkable notch in the land over Inverkeithing comes apparently near Mickry Island.

Should night come on when you have advanced to the North Craig, and are between the Herwit and Craigwaugh, you may, in fair weather, continue your course, by means of the light on Inch Keith. With the light N. $\frac{1}{4}$ W., you will be within these shoals, and may thence, with the lead going, steer W.N.W., until the light bears N.E. $\frac{1}{2}$ E., when you will be the length of the roads.

To sail from LEITH ROADS, UP THE FRITH, with a flood-tide, steer over to the northward, till Donabursal (Lord Moray's House) is shut in by the west end of Inchcolm; keeping it thus, will lead up clear of the Ox Scars. Should the weather be thick, you may steer across the ridge until the water deepens to 14, 15, or 16 fathoms, when you will be to the northward of the Ox Scars, and may steer for Inchcolm, and thence W. $\frac{1}{2}$ N. or W. by N., to North Ferry Point; or more to the northward into the Bay of Inverkeithing, or St. David's Road, which lies 2 miles to the west of Inchcolm. The marks for anchoring in this road are, Kinghorn Ness open to the northward of Inchcolm; Queen's Ferry open to the southward of the island called Inch Garvy, and St. David's Pier N.N.W., in from 7 to 10 fathoms, muddy ground. There is most room in the eastern part of the road.

To sail between the Ox Scars and Mickry Stone, keep North Berwick Law between Lang Craig and the south point of Inch Keith. The same mark leads to the northward of the Drum Sand.

Vessels from Leith Roads may pass to the southward of Mickry Island, by keeping the house upon Inch Garvy just shut in behind Hound Point, until abreast of Mickry. This will clear the reef, which extends $\frac{1}{2}$ a cable's length from the south part of the island. Off the south end of Mickry are 3 fathoms. In passing the island, give it a berth of about a cable's length, steering across the tail of the Drum Sand, which runs off from shore towards Mickry Island, in not less than 12 feet, and thence to the northward. A leading-mark is, Nelson's Monument on with the highest part of Arthur's Seat, bearing about S. by E. $\frac{3}{4}$ E., or Dalgety Kirk twice its apparent breadth to the westward of the Haystack Rock, bearing N. by W. $\frac{1}{4}$ W. Or, instead of passing to the southward of Mickry Island, you may go through between it and Mickry Stone. The channel is clear, and there are 12 feet in it. Near to Mickry Stone, on the west side, are nearly 2 fathoms. When you are above Mickry Stone, take care to keep the Lang Craig open, at least its own length, to the northward of Mickry Stone, until you open all the houses of Queen's Ferry outside of Hound Point. By proceeding thus, you will go clear of the Drum Sand, which dries from the Hound Point, half-way down to Mickry Island and Mickry Stone; but close to its elbow at Hound Point are 10 fathoms.

In proceeding between Inchcolm and Inverkeithing, keep the Haystack open to the northward of Inchcolm, until the westernmost houses in Queen's Ferry pass Inch Garvy, in order to avoid the Doig's Rock, which lies S. by E. $\frac{1}{4}$ E. from St. David's pier-head, and is 3 cables' length from the shore. It lies with the middle of the Haystack on with the north point of Inchcolm, and the middle of Inch Garvy on with the westernmost houses in South Ferry. There are only 3 feet on it. The Haystack is a high round rock, and lies about $\frac{1}{2}$ a mile to the westward of Inchcolm.

You may sail on either side of Inch Garvy, but the north channel is the widest, and therefore most frequented. When you have passed Inch Garvy, you will see the Bimer Rock, with a beacon on it, which is round, and nearly covered at high spring-tides; go on either side of it, but on the south side there is most room. Between Inch Garvy and the Bimer, the rapidity and whirling of the tide makes it sometimes difficult to steer a ship in light winds. There are 32 fathoms on the south side of the Bimer, and 10 fathoms between it and the Lang Craig on the north shore.

If you go on the north side of the Bimer, be careful to avoid the Mackintosh, a sunken rock, which lies about 3 cables' length S.S.W. from the Lang Craig, and $\frac{1}{2}$ of a mile E. by S. from the Bimer. There are only 11 feet on it. Very near to this, on the south side, are 17 fathoms; and between it and Lang Craig, are from 5 to 3 fathoms. The thwart-mark for this rock is, a farm-house, standing a little to the westward

[NORTH SEA.]

N

North Ferry, on with a round hill which is a little above it, bearing N. by E. The long marks are, the Bimer, on with the west corner of the wood, which is to the westward of Hopetown House, bearing W. by N.; and the house which stands on Inch Garry, on with the pigeon-house in Lord Roseberry's Park, bearing S.E. by S. To sail to the southward of the Bimer, keep Inch Keith lighthouse its apparent breadth to the southward of Carlin's Nose.

When you are past the Bimer, steer N.W., keeping a little to the northward of the mid-channel, in order to avoid the *Society Bank*, which extends nearly $\frac{1}{2}$ of a mile from the shore at the Society Houses, and nearly dries; though its outer edge is very steep. After you have passed Dove Craig, you may anchor where you please in Limekiln Road. The common anchorage is, with Dove Craig S.E. by E., or E.S.E., distant a mile; and Limekiln pier N.E., or N.E. by N., in 7 or 8 fathoms, on a bottom of mud.

FROM FIFE NESS TO DUNDEE, &c.

Description of the Land, &c.

FROM the N.E. end of the Carr Rocks, on which a buoy and beacon are placed, the course and distance to Babert Ness are N.W. by N., 4 miles; to the fairway buoy at the entrance of the River Tay, N. $\frac{3}{4}$ E., $8\frac{1}{4}$ miles; to Aberbrothick N.N.E., 15 miles; to Red Head N.E. by N., 19 miles; and to the Bell Rock N.E. by E. $\frac{3}{4}$ E., 10 miles.

INCH CAPE, or BELL ROCK, lies in latitude $56^{\circ} 26'$ north, and longitude $2^{\circ} 23'$ west. This was formerly considered the most dangerous and fatal rock off the eastern coast of Scotland. It is in length $\frac{1}{2}$ a mile, and breadth 110 yards, being bold and steep-to, except to the south-westward, where a *rocky reef* runs off. On the west, or inner side, close to the rock, are 4 fathoms water, and a little farther to the westward, 6 fathoms; close to the east, or outer side, are 7 fathoms; at a cable's length off, 16 fathoms; and $\frac{1}{2}$ a mile to the eastward, 23 fathoms. Its N.E. end is irregular and uneven, and the top of the rocks are generally from 4 to 8 feet above low water mark; but at high water the spring-tides, which here rise 20 feet, will cover it. A stone lighthouse is now erected upon it, which will render it no longer such an object of apprehension. This light is from oil, with reflectors, at the height of about 115 feet from low water, spring-tides. To distinguish it from others on the coast, it is made to revolve horizontally, and to exhibit from all points of the compass a bright light, and a light of a red colour, alternately: both showing themselves in the space of 2 minutes; so that in each revolution of 2 minutes, there will be seen a brilliant light, appearing at a distance like a star of the first magnitude, which, after attaining its full strength, is gradually eclipsed, and after a short interval of darkness, is succeeded by a light of a red colour, which in like manner increases to full strength, diminishes, and disappears. The coloured light, being less powerful, may not be seen when the bright one is first noticed; but the periodical revolution of the bright light will be sufficiently distinguishable. In thick foggy weather a bell is tolled, by machinery, night and day, at intervals of $\frac{1}{2}$ a minute. From the light the course and distance to the North Carr Rocks are S.W. by W. $\frac{3}{4}$ W., 10 miles; to Red Head N. $\frac{3}{4}$ E., nearly 11 miles; to the fairway buoy of the Tay N.W. by W. $\frac{1}{2}$ W., $8\frac{1}{4}$ miles; to May Island light S.W. $\frac{1}{4}$ W., 16 miles; and to Dunbar S.W. by S., 26 miles.

ST. ANDREW'S BAY.—From Babert Ness the coast bends N.W., forming one side of St. Andrew's Bay. It is steep-to and rocky, and has 7 fathoms close along shore. The northern side of the bay is lined with a *long sandy flat*, which stretches to the bar of Tay. St. Andrew's Bay is safe and clean, with anchorage, in from 7 to 9 fathoms. St. Andrew's Harbour is dry, and sheltered by a pier, forming a safe retreat for small vessels. Its entrance is but narrow, and lies on the south side of the pier-head. In entering, run a little southward, bringing the pier nearly end on; then steer along its south side into the harbour. There are from 12 to 14 feet in it on spring-tides, and 9 or 10 feet at neap.

About 2 miles to the northward of St. Andrew's, is the entrance to the Eden River; the bar of which frequently shifts, and the channel in is crooked, intricate, and varying, consequently dangerous. N. by E. $\frac{1}{2}$ E., 6 miles from St. Andrew's, is Tentsmoor Ness, the western point of the River Tay.

The RIVER TAY.—The entrance to the River Tay lies full $5\frac{1}{2}$ miles to the E.S.* eastward of Tentsmoor Ness, having a *sand bank* on each side; that on the north side is called the *Gaa*, extending $2\frac{1}{2}$ miles from Button Ness, and partly dries. The sand on the south side is called the *Abertay*; it stretches off, parallel to the Gaa, $5\frac{1}{2}$ miles from Tentsmoor Ness, and has a large black buoy, in $4\frac{1}{2}$ fathoms, near its extremity, called the fairway buoy. These sands are flat on the outside, but on their insides steep. The passage between the two sands is nearly a mile wide. There is a *bar* lying athwart it, having from $2\frac{1}{2}$ to 3 fathoms over it. In gales of wind the sea breaks quite across the bar. When you are coming in from the sea, the depth of water shoals gradually to 8 fathoms; but when as you are over the bar, you will have 5, and soon afterwards 7 and 9 fathoms. There are two lighthouses situated upon the northern shore at Button Ness; these have bright fixed lights, on separate towers, the one higher than the other, and appearing like stars of the first magnitude, at the distance of 3 or 4 leagues. The height of these lights are respectively 70 and 50 feet, and the lanterns 85 and 65 feet above high water; and when in a line, bear from each other N.N.W. $\frac{1}{4}$ W. and S.S.E. $\frac{1}{4}$ E. They are leading lights, intended to direct you to the fairway buoy at the entrance. Button Ness is also rendered remarkable, by its red sandy downs, which are the only ones of the kind on this part of Scotland, south of Aberdeen. In the Frith, off the sands of Barry, as far as the Horseshoe, are 12 feet water, until Broughty Castle comes on with the steeple in Dundee. The *Horseshoe* is a *ridge of stones*, stretching $\frac{2}{3}$ across the Frith from Broughty Castle, to a mile below it, having from 6 to 9 feet over it at low water. The *Larrick* is a *bank* opposite to the Horseshoe, and runs from Tentsmoor Point to Parton Craig, drying at low water, although near its edge are 5 and 4 fathoms. Near the outer edge of this bank is a small island, called the Scalp, with a hut upon it. From the bar to Dundee, the distance is 11 miles; the latter bearing from the former about N.W. by W. Beside Button Ness lights, there are two tide-lights shown at South Ferry Ness, the one somewhat higher than the other, and when in one, bear N.W. by W. $\frac{1}{2}$ W., being a leading direction for the fairway in clearing the Abertay and South Banks, and the Horseshoe to the northward. There is a red light on the east pier, on the starboard side of the entrance to Dundee Harbour; and a bright light on the middle pier, on the port or larboard hand in entering the wet docks: these are of the same height, and when seen in a line, are the leading-marks for clearing the southern side of the beacon rock. They are visible 5 or 6 miles off, in clear weather.* At the Craig Pier of Dundee, on the Forfar side of the River Tay, is a stationary light, exhibited throughout the night, for the particular direction of the ferry-boats. And at Newport, on the Fife side of the ferry, two lights are erected, one higher than the other; these brought in one, are leading-lights for clearing the east end of the middle bank.

The following buoys have lately been placed in the Frith of Tay, to point out the fairway channel, viz.:—three red buoys, called the elbow buoys, marked Nos. I., II., and III., to be left on the port or larboard side going in. In addition, and in continuation of these three buoys on the elbow, three other red buoys have lately been laid down on the north side of the Abertay Sand, and are numbered, IV., V., and VI. They commence about $1\frac{1}{2}$ mile W.N.W. from the inner elbow buoy, and continue in that direction; they are about $1\frac{1}{2}$ mile apart. All the red buoys (Nos. I. to VI.) must be left on the port or larboard, or south side of the river, when going in; and the three chequered buoys, called the Gaa buoys, on the starboard side. The inner buoy on the Gaa will be distinguished from the other two, by being chequered black-and-white, with a black top. A black buoy, marked L, and named the Lady buoy, placed about $1\frac{1}{2}$ mile above Button Ness; and the Horseshoe buoy (black), marked H; both these are to be left on the starboard side. In the fairway channel, when over the bar, you will have from 5 to 6 or 8 fathoms, so far as Button Ness; and when the ferry lights are in one, leading to the southward of the Horseshoe, 5, 6, 4, to $3\frac{1}{2}$ fathoms; between the Horse-

* The Port of Dundee has been lately much improved, by the erection of two wet-docks, of great capacity; and a third is in the course of building, to which a dry-dock and patent slip will be attached.

shoe and Broughty Castle, the depths increase to 9, 10 and 11 fathoms; and from thence to Dundee are 5, 4, and 3 fathoms.

From Tay Bar the coast extends N.E. by E., 11 miles, to Red Head. The town of Westhaven lies about 3 miles N.E. from Button Ness; between them is a sort of sandy bay, shoaling in a curve from the Gaa. Easthaven is $1\frac{1}{2}$ mile farther; the shore here is rocky $\frac{1}{2}$ a mile off. Both West and Easthaven are fishing towns.

The *Carr's End*, or *Elliot's Horses*, is a reef of rocks, between Easthaven and Aberbrothick; they stretch out a considerable way from the shore, and must have a berth in passing.

ABERBROTHICK, or ABERROATH, is 7 miles from the Bar of the Tay, from which it bears N.E. $\frac{1}{2}$ N.: here is a dry but safe harbour. A small light, of red colour, is shown on the northern pier-head, on the starboard side in entering the harbour; it is lighted by the pilots only when vessels are in the bay, in order to show the proper time of the tide for them to enter, and is commonly visible 2 or 3 miles, when the weather is clear. The roadstead lies nearly a mile off the town, and has from 9 to 10 fathoms water. Between Button Ness and Aberbrothick, you may run along in 10 fathoms with safety, a small distance off shore. The land from the Carr's End to beyond Aberbrothick is low, flat, and rocky, 2 cables' length off. Aberbrothick has a remarkable old abbey, standing near the west end of the town: from hence to Red Head is $4\frac{1}{2}$ miles; the shore between is high, rugged, and steep, with 14 fathoms at a mile distant. In this place stands the small fishing town of Auchmuthie.

DIRECTIONS FOR SAILING TO THE RIVER TAY, &c.

VESSELS bound for the River Tay, may go on either side of the Bell Rock with safety; for the lighthouse will be a sufficient guide by day, and the light by night, to direct them. Bring the Bass Rock open to the eastward of May Island, bearing S.W. by W., or May Island in that bearing, and you will pass to the southward and eastward of the Bell Rock. Bass Rock open of May Island, bearing S.W., will lead clear to the northward and westward of it; but the light itself will best direct your course.

If coming from the Frith of Forth, and bound to the Tay, after rounding the North Carr Rocks, a N. $\frac{1}{2}$ E. course will take you to the bar, in from 12 to 14 fathoms.

In thick weather, or in the night, steering in 18 fathoms will lead down the Frith close to Fife shore, and round clear of the North Carr into St. Andrew's Bay. If in crossing the bay, the water should shoal, you may, when Button Ness lights bear W. by N., stand out again to 16 or 18 fathoms. Keeping in the latter depth will lead to a clear berth, without Red Head.

But in turning to windward across St. Andrew's Bay, stand no nearer to the North Carr than 20 or 18 fathoms; from the Carr to Babert Ness, into 12; from Babert Ness to Tay Bar, into 10; from Tay Bar to Aberbrothick, into 13; and from thence to Red Head into 15 and 16 fathoms. You may stand off to the Bell Rock to 19 fathoms; and in that depth, to the southward or northward of this rock, you will be in a line between it and Fife Ness, or between it and Red Head.

When clear of and round the Carr, you may, if bound to St. Andrew's, steer along the south shore, going no nearer to it than 9 fathoms, till abreast of the town, and there anchor, about a mile from shore, in from 7 to 4 fathoms, sandy ground. If bound into the harbour, run a little to the southward, until the pier is nearly end on; then steer for the south side of the pier-head, keeping close along it into the harbour.

With easterly winds, ships in St. Andrew's Bay must allow for the flood-tide, which sets strongly to the westward on the north side, and slowly to the eastward on the south side; therefore, during flood, they should turn short boards close to the south shore, until the ebb makes, then, stretching over to the northward, the tide will carry them out.

When bound for the River Tay, after you have rounded the North Carr, steer so as to shut May Isle in behind Fife Ness; then continue with it just shut in, and bring

Button Ness to bear N.N.W. $\frac{1}{2}$ W., steering with it so, until the two lighthouses can be seen. Bring them on with each other, bearing N.N.W. $\frac{1}{2}$ W.; then run in with them in this direction, which will carry you safely over the bar, close to the fairway buoy, and into the proper channel, until the Ferry lights are in one; this mark will lead you through the best water, in 6, 3, 7, and 5 fathoms, to the southward of the Horse buoy; when past this buoy, steer towards Broughty Castle, and thence mid-channel to the anchorage at Dundee.* The Frith has been lately, as before observed, regularly buoyed, which will much facilitate its navigation.

Be careful never to take the bar on a spring-ebb, if possible to avoid doing so, for the tide is very strong, and will require a powerful wind to stem it.

In a large ship, you may anchor in the Ferry Road, off the westernmost houses on the north shore, above Broughty Castle, with the high lighthouse at Button Ness on with the castle, in 9 or 10 fathoms water; or to the eastward of the Newcome Shoal, which dries at low water, near the south shore. All the ground in the river is sand or gravel.

As the water breaks from side to side of the entrance in bad weather, especially when the tide runs against the wind, strangers, going in at such times, will be liable to danger. Such should, if possible, wait until the flood-tide is well made. If obliged to attempt the bar with an ebb-tide and westerly wind, carry very little after-sail, that the ship may the more readily answer her helm, when the tide, by taking her upon either bow, shall render such celerity necessary.

Off Red Head the tide runs very strongly, and often causes a rough sea, especially when the stream sets to windward. In the night-time, or in hazy weather, come no nearer to this part of the coast than the depth of 26 fathoms. There are 20 fathoms within $1\frac{1}{2}$ mile of the shore.

FROM RED HEAD TO BUCHAN NESS.

Description of the Land, &c.

TO the eastward of Red Head you will open Lunan Bay, which is about 2 miles broad. Here is good anchorage, in from 6 to 8 fathoms, with off-shore winds, Red Head bearing S. by W. or S.S.W. The south side of the bay is low and rocky, having also some *rocks*, above water, at a little distance from the beach. The bottom forms a steep bank; near which, on a little hill, stands the ruins of Red Castle. The north side is a high steep bank; at the end of which are Boddin limekilns, off which lies a *rock*, named *Boddin Rock*. At $1\frac{1}{2}$ mile to the eastward is Chapel Ness, off which lies the *Craig Rock*, visible at low water, spring-tides; and N.E. by N., a mile farther, is the south-western point of the entrance to Montrose.

MONTROSE.—N.E., 5 miles from Red Head, on the S.W. point of the South Esk River, called Montrose, or Scurdy Ness, is a battery; directly off which is the *Out Stone*, a *flat rock*, running out about $\frac{1}{2}$ of a mile, its outer part drying at low ebbs. There is also another large *rock*, called the *In Stone*, lying close to the Ness, and appearing at half-ebb. You will avoid them, by not going nearer to the Ness than 6 fathoms water. To the north-eastward of the entrance to the river, is Montrose Road; where the best mark for anchoring is, the town spire-steeple, on with Turin hill, bearing W. by N. or W.N.W., in 9, 8, or 7 fathoms. With this mark, you will have clean sandy ground; but more to the southward you will find it foul; while to the northward vessels may anchor, from $\frac{1}{2}$ a mile to a mile off shore, so far as the mouth of North Esk River, on clean sandy ground.

The town of Montrose lies on the north side of the river, about $1\frac{1}{2}$ mile from the Ness, the entrance to the harbour being between the Stones and the Annet. The *Annet*

* The high light in the harbour of Dundee, which is immediately to the westward of King William's dock gates, instead of a bright light, as formerly, is now a red light; and when seen to the N.W., with the red light on the east projection wall, leads vessels clear of the beacon rock. In entering the wet-docks, one light is to be left on the port or larboard, and the other on the starboard hand.

is a *bank*, which stretches out from the N.E. point of the river. The channel in is about the length of 3 ships wide; but farther in it widens. On the bar there are 18 feet; but the depth decreases as you advance towards Ferryden, on the south side of the river. Opposite Ferryden are 12 feet.

The Harbour of Montrose has been much improved of late. The piers have been lengthened, and two lighthouses erected on the north-eastern side of the river. A floating beacon is also placed on the outer extremity of the Annet Sand, and a beacon erected upon Montrose Ness; so that vessels may now reach the quays with neap-tides, in safety. The high light tower is 75 feet above the level of the sea, and the lower one 35 feet. Both are painted white; and, when in a line, bearing about W.N.W., serve for an excellent mark to take the harbour, by day as well as by night; for as there are 12 feet water on the bar at low water, vessels may safely run in at any time of the tide, in an easterly storm, and anchor in the Stell, about $\frac{3}{4}$ of a mile up. The lights exhibited from these towers are of a red colour, by which they will readily be distinguished from all others on this coast, and are visible 5 or 6 miles off. Three buoys are placed on the edge of the sand, on the north side of the entrance.

Opposite to the town is an island, called the Inch; and to the westward appear three hills, called the Horses, each being steep on its south side. The Muscle Scalp, over which the tide sets strongly, extends $\frac{3}{4}$ of the way from the N.E. side of the Inch, towards the shore, and is covered at half-flood.

Montrose is a place of much trade; but the rapidity of the tides, the narrowness of the channel, and the Annet and Stones (the former extending a mile from the north shore into the sea), rendered it, formerly, extremely dangerous for a stranger to attempt the harbour without a pilot; but the late improvements have greatly facilitated its navigation.*

At $3\frac{1}{2}$ miles N.E. from the South Esk, is the entrance to the North Esk, the land between being a low and sandy beach; and the anchorage off-shore good, gradually deepening, as you recede from the land, to 10 and 12 fathoms, which latter depth is about $1\frac{1}{2}$ mile off. John's Haven is about $3\frac{1}{2}$ miles farther; and 3 miles beyond that is Gurdon: these are two little creeks among the rocks, where small vessels resort. The coast, from John's Haven to Gurdon, is *rocky*; and behind, inland, is a remarkable high hill, called Craig Davie. Inver Bervie is situated between Gurdon and Tod Head; and is rendered remarkable by two hills, over the town, separated from each other by a deep valley: these are the above-mentioned Craig Davie and Bervie Brow. From Inver Bervie to Tod Head, the coast is all *rocky*, but steep-to, having 6, 7, and 8 fathoms close in.

TOD HEAD lies nearly $4\frac{1}{2}$ leagues N.E. by E. from the bar of Montrose, and 6 leagues from Red Head, in a similar direction. It is low, and therefore not easily perceived, the high hill of Craig Davie being frequently mistaken for it.

STONEHAVEN.—About $4\frac{1}{2}$ miles N.E. from Tod Head, lies the pier-harbour of Stonehaven, in which are 16 or 17 feet at high water, spring-tides; and with neap-tides 10 or 11 feet. Easterly and S.E. winds cause a great swell in the harbour. It dries at low water; so do the rocks on which the pier is erected, for a full cable's length out beyond the pier. Two lights (fixed) are placed on the pier, 20 feet above high water; the seaward, or lower light, bright; the landward, or upper light, red; their relative position N.W. $\frac{3}{4}$ W. and S.E. $\frac{3}{4}$ E. To sail into this place, run in close along the rocky shore, on the south side of the bay, until you are within a cable's length of the pier-head; then steer directly for the pier, going round its south end into the harbour. The north point of the bay has several *rocks* about it, called the *Carron Rocks*.

From Stonehaven the land runs N.E. by E., $7\frac{1}{2}$ miles, to Findon Ness; a little before you come to which, is Port Lethen. From Findon Ness to Greg Ness, the course is N.E., about 4 miles. From Greg Ness the shore bends northward to Girdle Ness, forming a small place, called Nig Bay. Between them, from Stonehaven to Greg Ness, the shore is all *rocky* and steep-to, having 12 to 15 fathoms close in. A *patch of rocks*, called the *Craig Maron*, lies $6\frac{1}{2}$ miles north-eastward of Stonehaven, extending $\frac{1}{2}$ of a mile from the shore: and 3 miles north-eastward of the latter, lies the *Cove Rock*, at

* Great improvements are still going on at the Harbour of Montrose. Mr. Kidd, the active harbour-master, has succeeded in cleansing the old harbour, as well as outside the gates, in the most complete and satisfactory manner.—*Montrose Review*, August 1st, 1845.

$\frac{1}{2}$ of a mile from the land: and a mile farther northward, are the *Hasmans*, a small patch, lying nearly the same distance from the shore.

ABERDEEN.—Girdle Ness is the south point of Aberdeen Bay. Off the Ness, at a little distance, lies a small *rocky shoal*, called the *Girdle*, appearing only at low-springs. Findon Ness open of Greg Ness, clears it to the eastward; and the pier-head light open of Short Ness, leads to the northward of it.

On Girdle Ness a lighthouse is erected, which was first lighted in October, 1833. It is a double light, exhibiting two fixed lights, one over the other, like stars of the first magnitude; but to a distant observer, the lights appear as one, having an elongated form. These lights are lit from oil, with reflectors, placed in lanterns, elevated respectively 115 and 185 feet above the medium level of the sea, and may be seen at the distance of 13 and 16 miles, and the intermediate distances according to the state of the weather.

The lighthouse is situated in latitude $57^{\circ} 8'$ north, and in longitude $2^{\circ} 3'$ west, bearing from the north pier of Aberdeen S. by W., distant 1220 yards; from Buchan Ness lighthouse S.W. $\frac{1}{2}$ W., distant 22 miles; and from the Bell Rock lighthouse N.E. $\frac{1}{4}$ N., distant 44 miles. The two lanterns at this station are open, or glazed, from N.N.E. to W.S.W. $\frac{1}{2}$ W., and intermediate points, easterly and southerly.

Two leading-lights have been established, for the safer guidance of vessels entering this port, and first lighted on the 10th of May, 1842. These lights have no reference whatever to the state of the tides, as they are exhibited from sun-set to sun-rise. But on other occasions, when (on account of the speats or floods in the River Dee, or from too much sea on the bar) it is, in the opinion of the captain-pilot, considered unsafe for vessels to attempt entering the port, the lights will not be exhibited. The lights are of a brilliant red colour, visible, in clear weather, at the distance of 5 or 6 miles, one above the other, and are elevated, the one about 30 feet, and the other 47 feet respectively above high water of spring-tides. These lights, when first distinctly visible in coming from the northward, bear W.S.W.; and in coming from the southward, due west; and when seen in a line, W. $\frac{1}{4}$ S., nearly: and if the depth of water permits, vessels may run for the harbour with safety.

Aberdeen Harbour lies close in with the north side of Girdle Ness, having a long pier, with a flag-staff upon it; also another pier, built along the southern shore. Nearly $\frac{1}{2}$ a cable's length from the outer end of the south pier, is a beacon, fixed on a *rocky reef*, which stretches out from the south shore; and $\frac{1}{2}$ a cable's length east from the beacon, is another *reef*, called *Short Ness*, lying also from the south shore about the same distance. From hence a *bar* runs across the harbour's mouth, to within a little more than $\frac{1}{2}$ a cable's length outside the outer end of the north pier-head, having but 2 feet at low water, and 4 feet when you get within the piers. The marks for the bar are, the north side of the south pier in sight; and Old Aberdeen Church, which has two pointed steeples, on with the east side of the Broad Hill. The course in is W.S.W. $\frac{1}{2}$ W., the channel being near to the south pier, and close along the jetty, running from the north pier inner end. Over the bar, at high water, there are 12 feet neaps, and 16 feet spring-tides. When there is sufficient water over the bar, a flag is hoisted in day-time on the north pier-head, and a light is placed there at night for the same purpose; but those unacquainted with the place should always take a pilot, for the sands shift, and the entrance is difficult.

Aberdeen Road lies just round to the northward of Girdle Ness. There is good riding in it, with off-shore winds, the Ness bearing S. by W. or S.S.W.; and the two steeples of Aberdeen in one, in 7, 8, and 9 fathoms.

NEWBURGH is a small but safe harbour, lying N.E. $\frac{1}{4}$ N. from Aberdeen, distant $10\frac{1}{2}$ miles. Over the bar are 12 and 13 feet with spring, and 8 and 10 with neap-tides; but the bar frequently alters, and therefore should not be attempted without a pilot. The shore, from Aberdeen to the Black Dog, is moderately steep; but from thence to Newburgh it is flat and sandy. The soundings are gradual—from 7 fathoms near the shore, to 18 and 20 fathoms 3 miles off.

A New Land-mark.—The Church of St. James, Cruden, formerly a plain building, and long regarded by mariners as a land-mark, has been lately re-built, with the addition of a tower and spire, nearly 100 feet high. The Church is situated on a hill, 200 feet above the level of the sea, and about 18 miles north from the port of Aberdeen.

the roadstead are, Gullan Ness E. by S., and Portseaton S.S.W., or S.W. by S.; and there is generally good anchorage on the south side of the Frith, in all parts, between Gullan Ness and Inch Keith, where there is a less depth than 8 fathoms, observing to avoid Craigwaugh and North Craig. There is also good anchorage in Largo Bay (the N.E. side excepted), with gravelly ground, in from 14 to 7 fathoms. The common marks are, Elie Ness E. by S., and Methel pier, N.N.W., in about 12 fathoms. With westerly winds, vessels may anchor off the east side of Inch Keith, in from 7 to 12 fathoms, soft ground.

The CHANNEL MOSTLY USED IN SAILING UP THE FRITH, is to the northward of Inch Keith. Large ships passing this way, must be careful to avoid the Blea, by keeping the remarkable point, called the Carlin's Nose, well open to the southward of Inchcolm. This mark should be kept on until you are nearly as far up as Burnt Island Church, that the *bank* which lies in the way, west of Petticur, may be avoided. The course and distance from abreast of Kinghorn Ness to abreast of Inchcolm, are W. $\frac{1}{2}$ N., about $4\frac{1}{2}$ miles. The water is deep, with hard rocky ground.

Burnt Island Road is a little to the westward of the pier. The marks are, the pier E.N.E., or the high land over Kinghorn open a little to the southward of the Black Rock east of Burnt Island, and Stanley Burn N.N.W. Here is good clayey ground, in from 9 to 12 fathoms; but be cautious of not going too near the Commons to the westward.

Vessels bound to the Roads of Leith, from the north side of Inch Keith, must give the Black Rock, which always appears above water, off the N.W. point of Inch Keith, a good berth. Thence they may steer to the southward, on either side of the Gunnet. The buoys will be a sufficient guide for avoiding the rocks; but should they be gone, keep North Berwick Law open to the northward of the Lang Craig, until Grange House opens to the westward of Burnt Island Church, when you will be clear of the rocks, and may steer to the southward. The mark for sailing between the Gunnet and Pallas Rocks, is Nelson's Monument on with Leith Martello tower, S.W. $\frac{1}{2}$ S.; and the mark for sailing to the westward of the Gunnet, is Nelson's Monument on with North Leith Church spire, S.S.W. $\frac{1}{2}$ W. In running over, in thick weather or in the night, by keeping the lead going, you may know when you are in the roads, by the water's deepening 1 or 2 fathoms. The instant that you find it shoal thence, drop your anchor, and be cautious not to get too far to the eastward, toward the Beacon Rocks and Symonds.

It has already been observed, that the Gunnet has a white buoy at each end, and the Pallas Rock a chequered buoy; therefore, in passing between them, you will leave the white buoy on your starboard side, and the chequered buoy on your port or larboard. A W.S.W. direction will then carry you to Leith Roads.

LEITH ROADS.—The MARKS for ANCHORAGE in the roads are, Barnbug Hall open to the northward of Cramond Island; and Edinburgh Castle a ship's length west of Newhaven, in 5 fathoms, muddy ground. Large ships should keep Barnbug Hall a ship's length open to the North of Cramond Island, for the deepest water lies in that direction.

CHANNELS TO THE SOUTHWARD OF INCH KEITH.—The channels to Leith Roads southward of Inch Keith, are also very good; the ground being generally soft, and the tide easy.

The black buoy on the Herwit, the pyramidal buoy on the North Craig, and the red buoy on the Craigwaugh, will be sufficient to point them out by day; and by night they must be avoided. The channel is nearly a mile wide. A leading-mark for sailing up the south channel, between the North Craig and Craigwaugh, is the highest part of North Berwick Law on with Rundel's summer-house, near Gullan Ness, bearing E.S.E. $\frac{1}{2}$ E. Keep these on, until Inch Garvy comes on Hound Point; then steer on in that direction, until Largo Law comes open of the N.W. point of Inch Keith, and you will be in the roads.

In sailing up the Frith, southward of the Craigwaugh Rock, stand into Aberlady Bay, until North Berwick Law comes on with the high land within Gullan Ness, taking care, at the same time, to keep the Law open to the northward of the notch on the south end of the high land. Continue with this mark on, until Inch Keith light bears N. by W.; then bring Barnbug Hall just touching the north point of Cramond Island, and it will lead into Leith Roads.

In turning, when within the North Craig, you may stand to the Herwit, until the westernmost glass-house at Leith comes nearly on with Edinburgh Castle; and to the Craigwaugh, until North Berwick Law comes within its own breadth of the notch before mentioned; and to the beacon rocks and Leith Craigs, until a remarkable notch in the land over Inverkeithing comes apparently near Mickry Island.

Should night come on when you have advanced to the North Craig, and are between the Herwit and Craigwaugh, you may, in fair weather, continue your course, by means of the light on Inch Keith. With the light N. $\frac{1}{2}$ W., you will be within these shoals, and may thence, with the lead going, steer W.N.W., until the light bears N.E. $\frac{1}{2}$ E., when you will be the length of the roads.

TO SAIL FROM LEITH ROADS, UP THE FRITH, with a flood-tide, steer over to the northward, till Donabursal (Lord Moray's House) is shut in by the west end of Inchcolm; keeping it thus, will lead up clear of the Ox Scars. Should the weather be thick, you may steer across the ridge until the water deepens to 14, 15, or 16 fathoms, when you will be to the northward of the Ox Scars, and may steer for Inchcolm, and thence W. $\frac{1}{2}$ N. or W. by N., to North Ferry Point; or more to the northward into the Bay of Inverkeithing, or St. David's Road, which lies 2 miles to the west of Inchcolm. The marks for anchoring in this road are, Kinghorn Ness open to the northward of Inchcolm; Queen's Ferry open to the southward of the island called Inch Garvy, and St. David's Pier N.N.W., in from 7 to 10 fathoms, muddy ground. There is most room in the eastern part of the road.

To sail between the Ox Scars and Mickry Stone, keep North Berwick Law between Lang Craig and the south point of Inch Keith. The same mark leads to the northward of the Drum Sand.

Vessels from Leith Roads may pass to the southward of Mickry Island, by keeping the house upon Inch Garvy just shut in behind Hound Point, until abreast of Mickry. This will clear the reef, which extends $\frac{1}{2}$ a cable's length from the south part of the island. Off the south end of Mickry are 3 fathoms. In passing the island, give it a berth of about a cable's length, steering across the tail of the Drum Sand, which runs off from shore towards Mickry Island, in not less than 12 feet, and thence to the northward. A leading-mark is, Nelson's Monument on with the highest part of Arthur's Seat, bearing about S. by E. $\frac{3}{4}$ E., or Dalgety Kirk twice its apparent breadth to the westward of the Haystack Rock, bearing N. by W. $\frac{3}{4}$ W. Or, instead of passing to the southward of Mickry Island, you may go through between it and Mickry Stone. The channel is clear, and there are 12 feet in it. Near to Mickry Stone, on the west side, are nearly 2 fathoms. When you are above Mickry Stone, take care to keep the Lang Craig open, at least its own length, to the northward of Mickry Stone, until you open all the houses of Queen's Ferry outside of Hound Point. By proceeding thus, you will go clear of the Drum Sand, which dries from the Hound Point, half-way down to Mickry Island and Mickry Stone; but close to its elbow at Hound Point are 10 fathoms.

In proceeding between Inchcolm and Inverkeithing, keep the Haystack open to the northward of Inchcolm, until the westernmost houses in Queen's Ferry pass Inch Garvy, in order to avoid the Doig's Rock, which lies S. by E. $\frac{1}{4}$ E. from St. David's pier-head, and is 3 cables' length from the shore. It lies with the middle of the Haystack on with the north point of Inchcolm, and the middle of Inch Garvy on with the westernmost houses in South Ferry. There are only 3 feet on it. The *Haystack* is a *high round rock*, and lies about $\frac{1}{2}$ a mile to the westward of Inchcolm.

You may sail on either side of Inch Garvy, but the north channel is the widest, and therefore most frequented. When you have passed Inch Garvy, you will see the Bimer Rock, with a beacon on it, which is round, and nearly covered at high spring-tides; go on either side of it, but on the south side there is most room. Between Inch Garvy and the Bimer, the rapidity and whirling of the tide makes it sometimes difficult to steer a ship in light winds. There are 32 fathoms on the south side of the Bimer, and 10 fathoms between it and the Lang Craig on the north shore.

If you go on the north side of the Bimer, be careful to avoid the *Mackintosh*, a *sunken rock*, which lies about 3 cables' length S.S.W. from the Lang Craig, and $\frac{1}{2}$ of a mile E. by S. from the Bimer. There are only 11 feet on it. Very near to this, on the south side, are 17 fathoms; and between it and Lang Craig, are from 5 to 3 fathoms. The thwart-mark for this rock is, a farm-house, standing a little to the westward of

[NORTH SEA.]

N

North Ferry, on with a round hill which is a little above it, bearing N. by E. The long marks are, the Bimer, on with the west corner of the wood, which is to the westward of Hopetown House, bearing W. by N.; and the house which stands on Inch Garvy, on with the pigeon-house in Lord Roseberry's Park, bearing S.E. by S. To sail to the southward of the Bimer, keep Inch Keith lighthouse its apparent breadth to the southward of Carlin's Nose.

When you are past the Bimer, steer N.W., keeping a little to the northward of the mid-channel, in order to avoid the *Society Bank*, which extends nearly $\frac{1}{2}$ of a mile from the shore at the Society Houses, and nearly dries; though its outer edge is very steep. After you have passed Dove Craig, you may anchor where you please in Limekiln Road. The common anchorage is, with Dove Craig S.E. by E., or E.S.E., distant a mile; and Limekiln pier N.E., or N.E. by N., in 7 or 8 fathoms, on a bottom of mud.

FROM FIFE NESS TO DUNDEE, &c.

Description of the Land, &c.

FROM the N.E. end of the Carr Rocks, on which a buoy and beacon are placed, the course and distance to Babert Ness are N.W. by N., 4 miles; to the fairway buoy at the entrance of the River Tay, N. $\frac{3}{4}$ E., $8\frac{1}{2}$ miles; to Aberbrothick N.N.E., 15 miles; to Red Head N.E. by N., 19 miles; and to the Bell Rock N.E. by E. $\frac{3}{4}$ E., 10 miles.

INCH CAPE, or BELL ROCK, lies in latitude $56^{\circ} 26'$ north, and longitude $2^{\circ} 23'$ west. This was formerly considered the most dangerous and fatal rock off the eastern coast of Scotland. It is in length $\frac{1}{2}$ a mile, and breadth 110 yards, being bold and steep-to, except to the south-westward, where a *rocky reef* runs off. On the west, or inner side, close to the rock, are 4 fathoms water, and a little farther to the westward, 6 fathoms; close to the east, or outer side, are 7 fathoms; at a cable's length off, 16 fathoms; and $\frac{1}{2}$ a mile to the eastward, 23 fathoms. Its N.E. end is irregular and uneven, and the top of the rocks are generally from 4 to 8 feet above low water mark; but at high water the spring-tides, which here rise 20 feet, will cover it. A stone lighthouse is now erected upon it, which will render it no longer such an object of apprehension. This light is from oil, with reflectors, at the height of about 115 feet from low water, spring-tides. To distinguish it from others on the coast, it is made to revolve horizontally, and to exhibit from all points of the compass a bright light, and a light of a red colour, alternately: both showing themselves in the space of 2 minutes; so that in each revolution of 2 minutes, there will be seen a brilliant light, appearing at a distance like a star of the first magnitude, which, after attaining its full strength, is gradually eclipsed, and after a short interval of darkness, is succeeded by a light of a red colour, which in like manner increases to full strength, diminishes, and disappears. The coloured light, being less powerful, may not be seen when the bright one is first noticed; but the periodical revolution of the bright light will be sufficiently distinguishable. In thick foggy weather a bell is tolled, by machinery, night and day, at intervals of $\frac{1}{4}$ a minute. From the light the course and distance to the North Carr Rocks are S.W. by W. $\frac{3}{4}$ W., 10 miles; to Red Head N. $\frac{3}{4}$ E., nearly 11 miles; to the fairway buoy of the Tay N.W. by W. $\frac{1}{4}$ W., $8\frac{1}{2}$ miles; to May Island light S.W. $\frac{1}{4}$ W., 16 miles; and to Dunbar S.W. by S., 26 miles.

ST. ANDREW'S BAY.—From Babert Ness the coast bends N.W., forming one side of St. Andrew's Bay. It is steep-to and rocky, and has 7 fathoms close along shore. The northern side of the bay is lined with a *long sandy flat*, which stretches to the bar of Tay. St. Andrew's Bay is safe and clean, with anchorage, in from 7 to 9 fathoms. St. Andrew's Harbour is dry, and sheltered by a pier, forming a safe retreat for small vessels. Its entrance is but narrow, and lies on the south side of the pier-head. In entering, run a little southward, bringing the pier nearly end on; then steer along its south side into the harbour. There are from 12 to 14 feet in it on spring-tides, and 9 or 10 feet at neap.

About 2 miles to the northward of St. Andrew's, is the entrance to the Eden River; the bar of which frequently shifts, and the channel in is crooked, intricate, and varying, consequently dangerous. N. by E. $\frac{1}{2}$ E., 6 miles from St. Andrew's, is Tentsmoor Ness, the western point of the River Tay.

THE RIVER TAY.—The entrance to the River Tay lies full $5\frac{1}{2}$ miles to the E.S. eastward of Tentsmoor Ness, having a *sand bank* on each side; that on the north side is called the *Gaa*, extending $2\frac{1}{2}$ miles from Button Ness, and partly dries. The sand on the south side is called the *Abertay*; it stretches off, parallel to the *Gaa*, $5\frac{1}{2}$ miles from Tentsmoor Ness, and has a large black buoy, in $4\frac{1}{2}$ fathoms, near its extremity, called the fairway buoy. These sands are flat on the outside, but on their insides steep. The passage between the two sands is nearly a mile wide. There is a *bar* lying athwart it, having from $2\frac{1}{2}$ to 3 fathoms over it. In gales of wind the sea breaks quite across the bar. When you are coming in from the sea, the depth of water shoals gradually to 8 fathoms; but when as you are over the bar, you will have 5, and soon afterwards 7 and 9 fathoms. There are two lighthouses situated upon the northern shore at Button Ness; these have bright fixed lights, on separate towers, the one higher than the other, and appearing like stars of the first magnitude, at the distance of 3 or 4 leagues. The height of these lights are respectively 70 and 50 feet, and the lanterns 85 and 65 feet above high water; and when in a line, bear from each other N.N.W. $\frac{1}{2}$ W. and S.S.E. $\frac{1}{2}$ E. They are leading lights, intended to direct you to the fairway buoy at the entrance. Button Ness is also rendered remarkable, by its red sandy downs, which are the only ones of the kind on this part of Scotland, south of Aberdeen. In the Frith, off the sands of Barry, as far as the Horseshoe, are 12 feet water, until Broughty Castle comes on with the steeple in Dundee. The *Horseshoe* is a *ridge of stones*, stretching $\frac{3}{4}$ across the Frith from Broughty Castle, to a mile below it, having from 6 to 9 feet over it at low water. The *Larrick* is a *bank* opposite to the Horseshoe, and runs from Tentsmoor Point to Parton Craig, drying at low water, although near its edge are 5 and 4 fathoms. Near the outer edge of this bank is a small island, called the Scalp, with a hut upon it. From the bar to Dundee, the distance is 11 miles; the latter bearing from the former about N.W. by W. Beside Button Ness lights, there are two tide-lights shown at South Ferry Ness, the one somewhat higher than the other, and when in one, bear N.W. by W. $\frac{1}{2}$ W., being a leading direction for the fairway in clearing the Abertay and South Banks, and the Horseshoe to the northward. There is a red light on the east pier, on the starboard side of the entrance to Dundee Harbour; and a bright light on the middle pier, on the port or larboard hand in entering the wet docks: these are of the same height, and when seen in a line, are the leading-marks for clearing the southern side of the beacon rock. They are visible 5 or 6 miles off, in clear weather.* At the Craig Pier of Dundee, on the Forfar side of the River Tay, is a stationary light, exhibited throughout the night, for the particular direction of the ferry-boats. And at Newport, on the Fife side of the ferry, two lights are erected, one higher than the other; these brought in one, are leading-lights for clearing the east end of the middle bank.

The following buoys have lately been placed in the Frith of Tay, to point out the fairway channel, viz.:—three red buoys, called the elbow buoys, marked Nos. I., II., and III., to be left on the port or larboard side going in. In addition, and in continuation of these three buoys on the elbow, three other red buoys have lately been laid down on the north side of the Abertay Sand, and are numbered, IV., V., and VI. They commence about $1\frac{1}{2}$ mile W.N.W. from the inner elbow buoy, and continue in that direction; they are about $1\frac{1}{2}$ mile apart. All the red buoys (Nos. I. to VI.) must be left on the port or larboard, or south side of the river, when going in; and the three chequered buoys, called the *Gaa* buoys, on the starboard side. The inner buoy on the *Gaa* will be distinguished from the other two, by being chequered black-and-white, with a black top. A black buoy, marked L, and named the Lady buoy, placed about $1\frac{1}{2}$ mile above Button Ness; and the Horseshoe buoy (black), marked H; both these are to be left on the starboard side. In the fairway channel, when over the bar, you will have from 5 to 6 or 8 fathoms, so far as Button Ness; and when the ferry lights are in one, leading to the southward of the Horseshoe, 5, 6, 4, to $3\frac{1}{2}$ fathoms; between the Horse-

* The Port of Dundee has been lately much improved, by the erection of two wet-docks, of great capacity; and a third is in the course of building, to which a dry-dock and patent slip will be attached.

shoe and Broughty Castle, the depths increase to 9, 10 and 11 fathoms; and from thence to Dundee are 5, 4, and 3 fathoms.

From Tay Bar the coast extends N.E. by E., 11 miles, to Red Head. The town of Westhaven lies about 3 miles N.E. from Button Ness; between them is a sort of sandy bay, shoaling in a curve from the Gaa. Easthaven is $1\frac{1}{2}$ mile farther; the shore here is rocky $\frac{1}{2}$ a mile off. Both West and Easthaven are fishing towns.

The *Carr's End*, or *Elliot's Horses*, is a reef of rocks, between Easthaven and Aberbrothick; they stretch out a considerable way from the shore, and must have a berth in passing.

ABERBROTHICK, or ABERROATH, is 7 miles from the Bar of the Tay, from which it bears N.E. $\frac{1}{2}$ N.: here is a dry but safe harbour. A small light, of red colour, is shown on the northern pier-head, on the starboard side in entering the harbour; it is lighted by the pilots only when vessels are in the bay, in order to show the proper time of the tide for them to enter, and is commonly visible 2 or 3 miles, when the weather is clear. The roadstead lies nearly a mile off the town, and has from 9 to 10 fathoms water. Between Button Ness and Aberbrothick, you may run along in 10 fathoms with safety, a small distance off shore. The land from the Carr's End to beyond Aberbrothick is low, flat, and rocky, 2 cables' length off. Aberbrothick has a remarkable old abbey, standing near the west end of the town: from hence to Red Head is $4\frac{1}{2}$ miles; the shore between is high, rugged, and steep, with 14 fathoms at a mile distant. In this place stands the small fishing town of Auchmutie.

DIRECTIONS FOR SAILING TO THE RIVER TAY, &c.

VESSELS bound for the River Tay, may go on either side of the Bell Rock with safety; for the lighthouse will be a sufficient guide by day, and the light by night, to direct them. Bring the Bass Rock open to the eastward of May Island, bearing S.W. by W., or May Island in that bearing, and you will pass to the southward and eastward of the Bell Rock. Bass Rock open of May Island, bearing S.W., will lead clear to the northward and westward of it; but the light itself will best direct your course.

If coming from the Frith of Forth, and bound to the Tay, after rounding the North Carr Rocks, a N. $\frac{1}{2}$ E. course will take you to the bar, in from 12 to 14 fathoms.

In thick weather, or in the night, steering in 18 fathoms will lead down the Frith close to Fife shore, and round clear of the North Carr into St. Andrew's Bay. If, in crossing the bay, the water should shoal, you may, when Button Ness lights bear W. by N., stand out again to 16 or 18 fathoms. Keeping in the latter depth will lead to a clear berth, without Red Head.

But in turning to windward across St. Andrew's Bay, stand no nearer to the North Carr than 20 or 18 fathoms; from the Carr to Babert Ness, into 12; from Babert Ness to Tay Bar, into 10; from Tay Bar to Aberbrothick, into 13; and from thence to Red Head into 15 and 16 fathoms. You may stand off to the Bell Rock to 19 fathoms; and in that depth, to the southward or northward of this rock, you will be in a line between it and Fife Ness, or between it and Red Head.

When clear of and round the Carr, you may, if bound to St. Andrew's, steer along the south shore, going no nearer to it than 9 fathoms, till abreast of the town, and there anchor, about a mile from shore, in from 7 to 4 fathoms, sandy ground. If bound into the harbour, run a little to the southward, until the pier is nearly end on; then steer for the south side of the pier-head, keeping close along it into the harbour.

With easterly winds, ships in St. Andrew's Bay must allow for the flood-tide, which sets strongly to the westward on the north side, and slowly to the eastward on the south side; therefore, during flood, they should turn short boards close to the south shore, until the ebb makes, then, stretching over to the northward, the tide will carry them out.

When bound for the River Tay, after you have rounded the North Carr, steer so as to shut May Isle in behind Fife Ness; then continue with it just shut in, and bring

Button Ness to bear N.N.W. $\frac{1}{2}$ W., steering with it so, until the two lighthouses can be seen. Bring them on with each other, bearing N.N.W. $\frac{1}{2}$ W.; then run in with them in this direction, which will carry you safely over the bar, close to the fairway buoy, and into the proper channel, until the Ferry lights are in one; this mark will lead you through the best water, in 6, 3, 7, and 5 fathoms, to the southward of the Horse buoy; when past this buoy, steer towards Broughty Castle, and thence mid-channel to the anchorage at Dundee.* The Frith has been lately, as before observed, regularly buoyed, which will much facilitate its navigation.

Be careful never to take the bar on a spring-ebb, if possible to avoid doing so, for the tide is very strong, and will require a powerful wind to stem it.

In a large ship, you may anchor in the Ferry Road, off the westernmost houses on the north shore, above Broughty Castle, with the high lighthouse at Button Ness on with the castle, in 9 or 10 fathoms water; or to the eastward of the Newcome Shoal, which dries at low water, near the south shore. All the ground in the river is sand or gravel.

As the water breaks from side to side of the entrance in bad weather, especially when the tide runs against the wind, strangers, going in at such times, will be liable to danger. Such should, if possible, wait until the flood-tide is well made. If obliged to attempt the bar with an ebb-tide and westerly wind, carry very little after-sail, that the ship may the more readily answer her helm, when the tide, by taking her upon either bow, shall render such celerity necessary.

Off Red Head the tide runs very strongly, and often causes a rough sea, especially when the stream sets to windward. In the night-time, or in hazy weather, come no nearer to this part of the coast than the depth of 26 fathoms. There are 20 fathoms within $1\frac{1}{2}$ mile of the shore.

FROM RED HEAD TO BUCHAN NESS.

Description of the Land, &c.

TO the eastward of Red Head you will open Lunan Bay, which is about 2 miles broad. Here is good anchorage, in from 6 to 8 fathoms, with off-shore winds, Red Head bearing S. by W. or S.S.W. The south side of the bay is low and rocky, having also some rocks, above water, at a little distance from the beach. The bottom forms a steep bank; near which, on a little hill, stands the ruins of Red Castle. The north side is a high steep bank; at the end of which are Boddin limekilns, off which lies a rock, named *Boddin Rock*. At $1\frac{1}{2}$ mile to the eastward is Chapel Ness, off which lies the *Craig Rock*, visible at low water, spring-tides; and N.E. by N., a mile farther, is the south-western point of the entrance to Montrose.

MONTROSE.—N.E., 5 miles from Red Head, on the S.W. point of the South Esk River, called Montrose, or Scurdy Ness, is a battery; directly off which is the *Out Stone*, a flat rock, running out about $\frac{1}{4}$ of a mile, its outer part drying at low ebbs. There is also another large rock, called the *In Stone*, lying close to the Ness, and appearing at half-ebb. You will avoid them, by not going nearer to the Ness than 6 fathoms water. To the north-eastward of the entrance to the river, is Montrose Road; where the best mark for anchoring is, the town spire-steeple, on with Turin hill, bearing W. by N. or W.N.W., in 9, 8, or 7 fathoms. With this mark, you will have clean sandy ground; but more to the southward you will find it foul; while to the northward vessels may anchor, from $\frac{1}{2}$ a mile to a mile off shore, so far as the mouth of North Esk River, on clean sandy ground.

The town of Montrose lies on the north side of the river, about $1\frac{1}{2}$ mile from the Ness, the entrance to the harbour being between the Stones and the Annet. The *Annet*

* The high light in the harbour of Dundee, which is immediately to the westward of King William's dock gates, instead of a bright light, as formerly, is now a red light; and when seen to the N.W., with the red light on the east projection wall, leads vessels clear of the beacon rock. In entering the wet-docks, one light is to be left on the port or larboard, and the other on the starboard hand.

is a *bank*, which stretches out from the N.E. point of the river. The channel is about the length of 3 ships wide; but farther in it widens. On the bar there are 18 feet; but the depth decreases as you advance towards Ferryden, on the south side of the river. Opposite Ferryden are 12 feet.

The Harbour of Montrose has been much improved of late. The piers have been lengthened, and two lighthouses erected on the north-eastern side of the river. A floating beacon is also placed on the outer extremity of the Annet Sand, and a beacon erected upon Montrose Ness; so that vessels may now reach the quays with neap-tides, in safety. The high light tower is 75 feet above the level of the sea, and the lower one 35 feet. Both are painted white; and, when in a line, bearing about W.N.W., serve for an excellent mark to take the harbour, by day as well as by night; for as there are 12 feet water on the bar at low water, vessels may safely run in at any time of the tide, in an easterly storm, and anchor in the Stall, about $\frac{3}{4}$ of a mile up. The lights exhibited from these towers are of a red colour, by which they will readily be distinguished from all others on this coast, and are visible 5 or 6 miles off. Three buoys are placed on the edge of the sand, on the north side of the entrance.

Opposite to the town is an island, called the Inch; and to the westward appear three hills, called the Horses, each being steep on its south side. The Muscle Scalp, over which the tide sets strongly, extends $\frac{3}{4}$ of the way from the N.E. side of the Inch, towards the shore, and is covered at half-flood.

Montrose is a place of much trade; but the rapidity of the tides, the narrowness of the channel, and the Annet and Stones (the former extending a mile from the north shore into the sea), rendered it, formerly, extremely dangerous for a stranger to attempt the harbour without a pilot; but the late improvements have greatly facilitated its navigation.*

At $3\frac{1}{2}$ miles N.E. from the South Esk, is the entrance to the North Esk, the land between being a low and sandy beach; and the anchorage off-shore good, gradually deepening, as you recede from the land, to 10 and 12 fathoms, which latter depth is about $1\frac{1}{2}$ mile off. John's Haven is about $3\frac{1}{2}$ miles farther; and 3 miles beyond that is Gurdon: these are two little creeks among the rocks, where small vessels resort. The coast, from John's Haven to Gurdon, is *rocky*; and behind, inland, is a remarkable high hill, called Craig Davie. Inver Bervie is situated between Gurdon and Tod Head; and is rendered remarkable by two hills, over the town, separated from each other by a deep valley: these are the above-mentioned Craig Davie and Bervie Brow. From Inver Bervie to Tod Head, the coast is all *rocky*, but steep-to, having 6, 7, and 8 fathoms close in.

TOD HEAD lies nearly $4\frac{1}{2}$ leagues N.E. by E. from the bar of Montrose, and 6 leagues from Red Head, in a similar direction. It is low, and therefore not easily perceived, the high hill of Craig Davie being frequently mistaken for it.

STONEHAVEN.—About $4\frac{1}{2}$ miles N.E. from Tod Head, lies the pier-harbour of Stonehaven, in which are 16 or 17 feet at high water, spring-tides; and with neap-tides 10 or 11 feet. Easterly and S.E. winds cause a great swell in the harbour. It dries at low water; so do the rocks on which the pier is erected, for a full cable's length out beyond the pier. Two lights (fixed) are placed on the pier, 20 feet above high water; the seaward, or lower light, bright; the landward, or upper light, red; their relative position N.W. $\frac{3}{4}$ W. and S.E. $\frac{3}{4}$ E. To sail into this place, run in close along the rocky shore, on the south side of the bay, until you are within a cable's length of the pier-head; then steer directly for the pier, going round its south end into the harbour. The north point of the bay has several *rocks* about it, called the *Carron Rocks*.

From Stonehaven the land runs N.E. by E., $7\frac{1}{2}$ miles, to Findon Ness; a little before you come to which, is Port Lethen. From Findon Ness to Greg Ness, the course is N.E., about 4 miles. From Greg Ness the shore bends northward to Girdle Ness, forming a small place, called Nig Bay. Between them, from Stonehaven to Greg Ness, the shore is all *rocky* and steep-to, having 12 to 15 fathoms close in. A *patch of rocks*, called the *Craig Maron*, lies $6\frac{1}{2}$ miles north-eastward of Stonehaven, extending $\frac{1}{2}$ of a mile from the shore: and 3 miles north-eastward of the latter, lies the *Cove Rock*, at

* Great improvements are still going on at the Harbour of Montrose. Mr. Kidd, the active harbour-master, has succeeded in cleansing the old harbour, as well as outside the gates, in the most complete and satisfactory manner.—*Montrose Review*, August 1st, 1845.

$\frac{1}{4}$ of a mile from the land: and a mile farther northward, are the *Hasmans*, a small patch, lying nearly the same distance from the shore.

ABERDEEN.—Girdle Ness is the south point of Aberdeen Bay. Off the Ness, at a little distance, lies a small *rocky shoal*, called the *Girdle*, appearing only at low-springs. Findon Ness open of Greg Ness, clears it to the eastward; and the pier-head light open of Short Ness, leads to the northward of it.

On Girdle Ness a lighthouse is erected, which was first lighted in October, 1833. It is a double light, exhibiting two fixed lights, one over the other, like stars of the first magnitude; but to a distant observer, the lights appear as one, having an elongated form. These lights are lit from oil, with reflectors, placed in lanterns, elevated respectively 115 and 185 feet above the medium level of the sea, and may be seen at the distance of 13 and 16 miles, and the intermediate distances according to the state of the weather.

The lighthouse is situated in latitude $57^{\circ} 8'$ north, and in longitude $2^{\circ} 3'$ west, bearing from the north pier of Aberdeen S. by W., distant 1220 yards; from Buchan Ness lighthouse S.W. $\frac{1}{2}$ W., distant 22 miles; and from the Bell Rock lighthouse N.E. $\frac{1}{4}$ N., distant 44 miles. The two lanterns at this station are open, or glazed, from N.N.E. to W.S.W. $\frac{1}{2}$ W., and intermediate points, easterly and southerly.

Two leading-lights have been established, for the safer guidance of vessels entering this port, and first lighted on the 10th of May, 1842. These lights have no reference whatever to the state of the tides, as they are exhibited from sun-set to sun-rise. But on other occasions, when (on account of the speats or floods in the River Dee, or from too much sea on the bar) it is, in the opinion of the captain-pilot, considered unsafe for vessels to attempt entering the port, the lights will not be exhibited. The lights are of a brilliant red colour, visible, in clear weather, at the distance of 5 or 6 miles, one above the other, and are elevated, the one about 30 feet, and the other 47 feet respectively above high water of spring-tides. These lights, when first distinctly visible in coming from the northward, bear W.S.W.; and in coming from the southward, due west; and when seen in a line, W. $\frac{3}{4}$ S., nearly: and if the depth of water permits, vessels may run for the harbour with safety.

Aberdeen Harbour lies close in with the north side of Girdle Ness, having a long pier, with a flag-staff upon it; also another pier, built along the southern shore. Nearly $\frac{1}{2}$ a cable's length from the outer end of the south pier, is a beacon, fixed on a *rocky reef*, which stretches out from the south shore; and $\frac{1}{2}$ a cable's length east from the beacon, is another *reef*, called *Short Ness*, lying also from the south shore about the same distance. From hence a *bar* runs across the harbour's mouth, to within a little more than $\frac{1}{2}$ a cable's length outside the outer end of the north pier-head, having but 2 feet at low water, and 4 feet when you get within the piers. The marks for the bar are, the north side of the south pier in sight; and Old Aberdeen Church, which has two pointed steeples, on with the east side of the Broad Hill. The course in is W.S.W. $\frac{1}{2}$ W., the channel being near to the south pier, and close along the jetty, running from the north pier inner end. Over the bar, at high water, there are 12 feet neaps, and 16 feet spring-tides. When there is sufficient water over the bar, a flag is hoisted in day-time on the north pier-head, and a light is placed there at night for the same purpose; but those unacquainted with the place should always take a pilot, for the sands shift, and the entrance is difficult.

Aberdeen Road lies just round to the northward of Girdle Ness. There is good riding in it, with off-shore winds, the Ness bearing S. by W. or S.S.W.; and the two steeples of Aberdeen in one, in 7, 8, and 9 fathoms.

NEWBURGH is a small but safe harbour, lying N.E. $\frac{1}{4}$ N. from Aberdeen, distant $10\frac{1}{2}$ miles. Over the bar are 12 and 13 feet with spring, and 8 and 10 with neap-tides; but the bar frequently alters, and therefore should not be attempted without a pilot. The shore, from Aberdeen to the Black Dog, is moderately steep; but from thence to Newburgh it is flat and sandy. The soundings are gradual—from 7 fathoms near the shore, to 18 and 20 fathoms 3 miles off.

A New Land-mark.—The Church of St. James, Cruden, formerly a plain building, and long regarded by mariners as a land-mark, has been lately re-built, with the addition of a tower and spire, nearly 100 feet high. The Church is situated on a hill, 200 feet above the level of the sea, and about 18 miles north from the port of Aberdeen.

COLLIESTOWN is 3 miles from Newburgh, and principally occupied by fishermen. Between Aberdeen and Newburgh, are some small sand-hills. A little eastward of this the shore becomes *rocky*, and continues so to Cruden Scars, a distance of about 5 miles, east. These *Scars* are a *cluster of rocks*, partly above water, running $\frac{1}{2}$ a mile out; close to them are 12 fathoms: and to the north-eastward is a sandy bay, having a small town at the bottom; eastward of which is Slain's Castle. Off the town is a *sunken rock*, called the *Buss*, lying about a cable's length from the shore. Four miles hence is Buchan Ness, the coast between being high rugged cliffs, steep-to, having 12 and 14 fathoms close in, and increasing to 30 at a little distance. There is a round hill, with a heap of stones at the top, called Sterling hill, which is frequently mistaken for Buchan Ness.

From Girdle Ness, the course and distance to Buchan Ness are N.E. $\frac{1}{2}$ E., 22 miles; and from Buchan Ness to Tod Head S.W. $\frac{1}{2}$ W., 38 miles: to Fife Ness S.W., westerly, 77 miles; and to St. Abb's Head S.W. by S., 96 miles.

DIRECTIONS FOR SAILING BETWEEN RED HEAD AND BUCHAN NESS.

FROM Red Head to Tod Head, the course and distance are N.E. by E., $18\frac{1}{2}$ miles. Vessels sailing between them, in the night, should not come into less water than 30 fathoms; and running along shore, should be careful to give a good berth to the Craig Rocks, keeping the Red Head outside of Chapel Ness, to avoid the Stones and Annet Banks, at the entrance of Montrose.

To run into **MONTROSE**, you must have plenty of sail. The marks for entering are, the two lighthouses in one, bearing W.N.W. When in, near the point, edge to the northward, to avoid the In Stone. Steer up mid-channel to Ferryden, when you may anchor; or from Ferryden to the northward, if bound up to the town, keep the star-board shore aboard all the way up to the quay, in order to avoid the Muscle Scalp, which lies off the N.E. side of the Inch, covered at half-flood, and over which the tide sets strongly.

MONTROSE ROAD lies a little to the northward of the harbour's mouth; and the common anchoring place is a mile from the shore, with the steeple of Montrose, on Turin hill, bearing W. by N. or W.N.W., in from 7 to 9 fathoms, on sandy ground. More to the southward the ground is *foul*; but to the northward there is anchorage, from $\frac{1}{2}$ a mile to a mile off shore, as far as the mouth of the North Esk River, on clean sandy ground.

Between Tod Head and Girdle Ness, in the night, stand into no less depth than 35 or 32 fathoms.

STONEHAVEN.—To sail into Stonehaven, run close along the rocky shore, on the south side of the bay, until within a cable's length of the pier-head. Then steer directly for the latter, so as to go round its south end into the harbour. At night, two fixed lights are exhibited on the pier-head (see page 94).

ABERDEEN.—To sail into Aberdeen Harbour from the southward, with south or S.W. winds, when it becomes necessary to keep the south shore on board, keep Findon Ness open of Greg Ness, until the pier-head comes in sight, in order to avoid the Girdle Rock. By night you will be clear of it so soon as the pier-head light comes in sight; but the lights at Girdle Ness will be your best guide. When near Short Ness, steer so as to open the northernmost whale fisher's boiling-house outside of the north pier-head; and keep it so, until the north side of the south pier begins to appear in sight; then haul up into the harbour. This mark carries you over the south end of the bar, where there is, perhaps, a foot or two less water than in the middle of it. To sail over the bar in the deepest water, steer in with the harbour fairly open; and when Old Aberdeen Church steeples are shutting in behind the east end of the broad hill, you will be passing the bar. When in between the piers, keep rather nearer the south side, and pass close to the end of the low jetty which runs out from the inner end of the

north pier: the pilots will then direct you where to lie. (For the particulars of the new leading-lights at Aberdeen, see page 95.)

ABERDEEN ROAD is to the northward of Girdle Ness. The marks for anchoring in it are, the two steeples of Aberdeen in one; and Girdle Ness bearing S. by W. or S.S.W., in from 7 to 9 fathoms water. Here vessels will ride very well, with off-shore winds.

Between Aberdeen and Newburgh, stand no nearer to the shore than into the depth of 9 or 7 fathoms, especially a little to the southward of the latter, because of some *sandy ridges*, thrown up with gales of wind, a little distance from the shore. Newburgh is a safe harbour; but as the bar sometimes shifts, it should not be attempted without a pilot.

Between Newburgh and Buchan Ness the shore is all bold, but *rocky*, except Cruden Scars and the Buss, which are above water, and may be approached, by day, in 12 fathoms; but by night, into not less depth than 34 fathoms. Upon Buchan Ness there is a lighthouse, which will be described hereafter.

TIDES FROM ST. ABB'S HEAD TO BUCHAN NESS.

Mariners navigating this part of the coast, should be particularly attentive to the flowing and setting of the tides, which are as follow:—

It is high water, full and change, at Dunbar, at 2 o'clock; in the Frith of Forth, at Leith, and the other pier-havens, at 22 minutes after 2; at Fife Ness, by the shore, at half after 1; St. Andrew's, at 2; Dundee, at a quarter after 2; Tay Bar, at 2; Montrose, at 1h. 36m.; Stonehaven, at 1h. 20m.; Aberdeen Bar, at 1h. 10m.; Newburgh, at 1; and Buchan Ness, at 12h. 30m.

The perpendicular rise of tide, in feet, is nearly as follows:—Dunbar, springs 15, neaps 9; Frith of Forth and the pier-havens, springs 16, neaps 8; St. Andrew's, springs 15, neaps 9; Dundee and Tay Bar, springs 16, neaps 10; Montrose and Stonehaven, springs 13, neaps 8; Aberdeen, springs 14, neaps 9; Newburgh to Buchan Ness, springs 13, and neaps 8 feet.

As the stream of tide in the offing sets to the southward with considerable strength, at a great distance from shore, it follows, that the length of time between the time of high water on shore and the time of high water in the offing, will be in proportion; and we find that the stream runs to the southward in the offing, 3 hours after high water on shore. Gales of wind from between W.S.W. and N.W., raise the tide higher, and cause the stream of flood to run some time longer in the offing. Easterly and S.E. winds have a contrary effect.

The velocity of tide is greatest against the projecting points, as at Buchan Ness, Fife Ness, St. Abb's Head, &c. &c.; as also in passing over the fishing-banks off the coast, upon which the stream runs longer than in other parts, after it changes on shore. In the bays which fall out of the course of the tide, on the contrary; as between Montrose and John's Haven, and Aberdeen and Slain's Castle, the current runs slowly, and turns sooner in proportion: but in the Frith, and other inlets, where the stream sets almost directly in, the current becomes stronger, according to the decrease of breadth or depth.

Off the mouth of the Frith and St. Andrew's Bay, the tide is affected in its course by the flood setting in, and drawing the latter part of the ebb and first of flood, which answer to the in-land flood, in shore; and the Frith's ebbs, forcing the latter part of flood and first of ebb, from shore.

The stream off Buchan Ness is the strongest on this coast, and runs with a velocity of about 4 knots in springs, and 2½ on neaps; and with neaps, the tide is sooner at its height, and does not run so long as with springs. At 6 miles off the Ness, the stream of flood runs till 2 o'clock; and at 12 miles off, till 3. Thence the tide continues on a southerly course, over the fishing-banks, towards the Staples, the stream ending 3 hours after high water on the adjacent shores. At 3 miles outside of the Staples, it runs until

[NORTH SEA.]

4 o'clock; and at 12 miles, until 5. Continuing its course thence along the English coast, at 5 or 6 leagues from shore, it runs until about 3 hours after high water on shore, as above.

From St. Abb's Head the flood sets to the southward; but the last 3 hours of ebb sets along the coast of Dunbar, and makes the first of flood into the Frith. It begins to run up past the Bass at half after 7, and is high water there at 2h. 15m. The ebb then coming out, joins the last of the flood, going round the Head to the southward, and continuing nearly 3 hours, until the ebb makes outside; which, coming from the southward, meets the ebb from the Frith, off Fal's, or Fast Castle, with a noisy rippling, continuing until the Frith flood makes again.

The Frith flood upon the south shore, commences at Fast Castle, or between it and Dunbar, and sets to the westward (passing the Bass) half an hour sooner than on the north side of May Island, particularly with southerly and south-westerly winds, which accelerate it on that side.

Past the Bass, on full and change days, the flood runs up until 2h. 15m.; and on the north side of May Island till 2 o'clock. The stream here runs only from between $1\frac{1}{2}$ or 2 miles an hour, until between Inch Keith and Kinghorn Ness, where, on springs, it runs 3 miles. The stream in Leith Roads begins to run down, past the Beacon Rocks, nearly $\frac{1}{2}$ an hour before high water.

At 2 miles outside of Red Head, the flood, on full and change days, runs until 3 o'clock, though it be high water on the shore at 1h. 30m. Round this head the flood sets into St. Andrew's Bay, until its last quarter, which sets south and S.S.E.

Westward of Red Head the flood sets W.S.W. along shore, past Aberbrothick and the bar of the River Tay, towards St. Andrew's Bay, running until 2h.; and vessels passing Tay Bar, must be careful to allow for it, particularly in a calm, or with little wind, as it sets directly on the Abertay. The ebb, on the contrary, sets on the Gaa. From a little way within the Tay bar, the tide takes the course of the river to Dundee, where it runs until 2h. 30m.

From the Abertay, the tide sets strongly into the Edenmouth; but between St. Andrew's and Babert Ness, it is scarcely perceptible. From Babert Ness to Fife Ness, the flood sets moderately to the S.E.; but increases its velocity towards Fife Ness. Outside of the North Carr it becomes much stronger, and runs until 2h. 30m.

About the Bell Rock it is high water at 1h. 30m.; but continues to run outside until 4. Within the Rock, and off St. Andrew's Bay, the flood runs until 3 o'clock; the first part of it, here, and off the Frith, setting in a direction for May Island; the middle to the south; and the last part S.E. The first part of the ebb sets from E.N.E. to N.E.; the middle N.N.E.; and the last part north and N.N.W.

The flood sets strongly into the harbour of Montrose; and the stream runs until nearly 3h., setting across the mouth of that harbour to the southward, over the Out Stone; and the ebb to the northward, over the Annet, which should be particularly remembered and attended to.

The flood also sets strongly into the harbour of Newburgh; but the current outside does not set at the rate of more than $1\frac{1}{2}$ mile an hour. Very little tide sets into the harbour of Aberdeen; and, with freshes, the stream always runs outward. The flood past Girdle Ness runs to the southward, until 2h. 30m. When strongest, it runs here at the rate of $2\frac{1}{2}$ miles; neaps $1\frac{1}{2}$; and the same, nearly, at Tod Head.

FROM BUCHAN NESS TO DUNCANSBY HEAD, INCLUDING THE FRITHS OF MORAY AND TAIN.

Description of the Land, &c.

BUCHAN NESS LIGHTHOUSE.—By order of the Commissioners of the Northern Lighthouses, a stone lighthouse has been erected upon Buchan Ness, of which the following is a specification:—

"The peninsular piece of ground, called Buchan Ness, is situated in latitude $57^{\circ} 28'$ north, and in longitude $1^{\circ} 46'$ west. From Rattray Briggs, the light will be seen over the eastern part of the town of Peterhead, bearing S.S.W. $\frac{1}{2}$ W., distant 9 miles; from Cruden Scars N.E., distant 6 miles; and from Girdle Ness N.E. $\frac{1}{2}$ E., distant 25 miles. The lantern is open, or glazed, from N. by E. to S.W. by W., and intermediate points easterly. The bearings are taken by compass; and the variation is about 27° west.

"This light having a somewhat novel appearance, from the quick revolution of its reflector-frame, will be known to mariners as a flashing, or twinkling light, which, in every 5 seconds of time, emerges from a state of partial darkness, to a transitory, or momentary light, resembling a star of the first magnitude. It will thereby be readily distinguished from the slow motion and red colour of the Bell Rock light, towards the south; or from the stationary light of Kinnaird's Head towards the north.

"The light is from oil, with reflectors, elevated 130 feet above the medium level of the sea. In clear weather it will be seen at a distance of 6 leagues, and intermediately according to the state of the atmosphere."

The land about Buchan Ness is high, and visible at a great distance. Moor Mount is a remarkable mountain, and the only one in Buchan. It may be seen to the northward, southward, and eastward, appearing long, high, and like a saddle, hollowed in the middle: but, when seen from the westward, it seems round. The Paps of Caithness are two high hills, with sugar-loaf tops, having some lower hills about them. These may be seen, in clear weather, from the south and S.E., 14 or 15 leagues. Ness and Duncansby Heads are, in appearance, so alike, that they have often been mistaken for each other. They are both high, steep, and rocky points of land; but Duncansby Head may be distinguished at a distance, by a large rock, about a mile to the southward of the head, called John o'Groats's House, or Duncansby Castle, which may easily be perceived 5 leagues off.

PETERHEAD stands upon a low rocky point, about 2 miles N.N.E. $\frac{1}{2}$ E. from Buchan Ness, having a stone pier, serving to shelter the harbour from the east and S.E. winds. It dries, and is only fit for small vessels. *Calk Skerry* is a rock, above water, at the mouth of the bay, lying nearly N.E. by E., distant $\frac{3}{4}$ of a mile from Buchan Ness. West from the Skerry is another rock, appearing at spring-ebbs: between are 12 fathoms. There are 9 fathoms in the bay within; and 12 and 14 fathoms between it and Peterhead, all clean ground. Here vessels may anchor, with off-shore winds. A rocky reef stretches $\frac{1}{2}$ a cable's length from the Skerry; and rocks lie a ship's length off all round it. Ships bound to the northward may, with N.W. winds, anchor to the southward of Calk Skerry, in 8 or 9 fathoms; but they must be careful to avoid being caught there with southerly winds. More than a league from Peterhead, is *Scotsdown Briggs*, a patch of rocks, extending $\frac{1}{4}$ a mile from the shore: and about N. by E., $8\frac{1}{2}$ miles from Buchan Ness, is Rattray Head, from which a ledge of rocks, called *Rattray Briggs*, runs off east, above $\frac{1}{4}$ of a mile. You will avoid these ledges, by not coming nearer to the shore than 13 fathoms; or by keeping Moor Mount, or *Mormond Hill*, in sight, above the land of Rattray Head. The old mill near Peterhead, in one with Stirling Peak, near Buchan Ness, bearing S.S.W., clears the Briggs, in $2\frac{1}{2}$ fathoms.

RATTRAY HEAD is a bank, with 6 fathoms water on it, bearing E. by S., about $\frac{1}{2}$ mile from Rattray Head. It extends north and south about $\frac{1}{2}$ a mile. The western spire of Peterhead in one with the peak, bearing S.S.W. $\frac{1}{4}$ W., clears the Head to the eastward, in 12 fathoms.

At 5 miles N. by W. from Rattray Head, is the little fishing-town of Cairnbulg; from off which lie the *Cairnbulg Scars*, a reef of rocks, nearly dry at low water, and stretching out about $\frac{1}{2}$ of a mile. They are steep-to, having 5 and 6 fathoms close to them. Keep Troop Head outside of Kinnaird's Head, and you will go clear of them.

At $1\frac{1}{2}$ mile E. by N. from Cairnbulg Point, lies *Steratan Rock*, with 5 fathoms on it. The marks for it are, Invarallochy Castle in one with White Link House, bearing S.W. $\frac{1}{4}$ W. It has from 9 to 15 fathoms close to it.

COLONEL ROCK lies a mile E. by S. $\frac{1}{2}$ S. from Kinnaird's Head, and has $5\frac{1}{2}$ fathoms upon it, with 14 fathoms close to it. About $\frac{3}{4}$ of a mile E.N.E. from Roseheart Head, is a small patch, of $5\frac{1}{2}$ fathoms, with 20 fathoms close to it on the north side, and 11 fathoms to the southward of it.

KINNAIRD'S HEAD, in latitude $57^{\circ} 42'$ north, and longitude $2^{\circ} 0'$ west, lies N.W. $\frac{1}{4}$ W. from Cairnbulg, full 2 miles; and is remarkable for its castle, and a stone lighthouse upon it, 57 feet in height, which shows a fixed light, 120 feet above high water at spring-tides; and, in fair weather, may be seen 5 leagues off, from all points between W.N.W., seaward, to S.E. On the east side of the head is the tide-haven of Fraserburg, having a sandy kind of bay between it and Cairnbulg.

From Kinnaird's Head, the course and distance to Duncansby Head are N. $\frac{1}{4}$ W., 69 miles. From Kinnaird's Head, the coast takes a W.N.W. $\frac{1}{2}$ N. direction, to Troop Head, Knock Head, and Portsoy.

Troop Head is a remarkable promontory, formed of lofty and steep cliffs, having a reef extending from it, with a rock, above water, at the end of it. It is distant from Kinnaird's Head 9 miles. The shore between them is steep-to.

On the east side of a point, nearly half-way between Kinnaird's and Troop Head, is the small town of Rosehearty: west of which is Aberdour Bay. Having passed Troop Head, you will see the small tide-haven of Gardenston. Bamff lies $7\frac{1}{2}$ miles W.N.W. $\frac{1}{4}$ W. from Troop Head, and is also a tide-haven; and very near, is the little port of Macduff; on the eastern side of which is the *Collie Rock*, drying at half-tide, and having a narrow channel between it and the shore. The toll-house W. $\frac{1}{2}$ N., open north of the gas-chimney, clears the Collie Rock to the northward.

Five miles beyond Bamff, is Portsoy, another small tide-haven, to the westward of which, and lying a little off-shore, are the *Scate Rocks*. These are dangerous, and should have a good berth, for several ships have been wrecked upon them. Boyndie Head is also rocky. About 2 leagues N.W. by W. $\frac{1}{4}$ W. from Scate Rocks, is a rocky reef, called *Scar Nose*. This is about 18 miles from Troop, and 27 miles from Kinnaird's Head. Two miles S.E. from Scar Nose is Logie Head, and between them is Cullen Town and Bay. Within the latter is a small reef, called the *Reeple*, a little more than half-way between the town and Scar Nose, but not in the way of vessels passing along the shore. A little to the southward are three remarkable hills in-land, by which this part of the coast may be known. They are commonly called the Hills of Cullen. Cromach Head is nearly 2 miles to the westward of Scar Nose, and has some rocks lying of it. Two miles farther is Craig Inron, and a rock lying a little off the land. You now enter Spey Bay. When you come from the eastward, Cowsey, the west point of the bay, appears like an island. It is about 14 leagues from Kinnaird's Head, and 13 miles from Cromach Head. Seven miles W. by N. from Cromach Head is the River Spey, where small vessels frequently ride; about $2\frac{1}{2}$ miles east from which, is the small town of Buckie.

LOSSIE MOUTH.—To the westward of Spey River is a remarkable black hill. The coast round Spey Bay is generally low, and the bay of moderate depth, decreasing as you near the shore. Lossie Mouth is a small tide-haven, $1\frac{1}{2}$ mile S. by E. $\frac{1}{4}$ E. from Cowsey Point. This may be considered the southern boundary of Moray Frith. It appears that the entrance of this harbour is gradually washing away and becoming deeper, inasmuch as there are now 12 feet water, where formerly there were only 9 feet. On the western side of Cowsey Point, and running out a mile from the land, is *Halliman's Scars*, or *Covesea Skerries*, many of which are above water; close to them are 8, 10, 12, and 14 fathoms, and farther out 20 to 46 fathoms, muddy ground. Between Halliman's Scars and Cowsey Point, lies the small harbour of Stotfield.* Eight miles W. by N. from Cowsey Point, and 6 miles west from Halliman's Scars, or Covesea Skerries is Burgh Head, being lower than the land adjoining, but terminating in a high cliffy point.

COVESEA SKERRIES LIGHTHOUSE.—*Edinburgh, April 10th, 1846.*—*Notice to Mariners.*—This lighthouse has been built upon the Point of Craighead, in the County of Elgin, the light of which will be exhibited on the night of the 15th of May, 1846, and every night thereafter, from sun-set to sun-rise; and a beacon has been placed on that part of the Covesea Skerries, called Halliman's Scars, which lies off Craighead. The beacon bears from the lighthouse E.N.E. $\frac{1}{4}$ E., and consists of framework of iron, surmounted by a cylindric cage, and a cross, 48 feet above high water. There are steps leading from the rock to the cage, in which a temporary shelter may be found, in the event of shipwreck on the rock.

* *Stotfield Harbour, near Craighead.*—Considerable improvements are being made in extending the pier, and enlarging the inner basin of this harbour.—*Aberdeen Journal, Jan. 15th, 1845.*

The lighthouse is situated in latitude $57^{\circ} 43' 21''$ north, and longitude $3^{\circ} 20' 14''$ west. By compass, it bears from Tarbet Ness lighthouse S.E. by S. $\frac{1}{4}$ S., distant $16\frac{1}{2}$ miles; from Burgh Head E. by S. $\frac{1}{4}$ S., $5\frac{1}{2}$ miles; from Stotfield Point W.N.W., 2 miles; from the beacon on Halliman's Scars W.S.W. $\frac{1}{4}$ W., distant a mile; and from Scarnose N.W. by W. $\frac{1}{4}$ W., 16 miles. It will exhibit a revolving light, which gradually attains its brightest state once every minute, and then as gradually declines, until, to a distant observer, it totally disappears. From W. by N. $\frac{1}{4}$ N. to S.E. by E. $\frac{1}{4}$ E., the light will be of the natural appearance; but from S.E. by E. $\frac{1}{4}$ E. to S.E. $\frac{1}{4}$ S., it will be coloured red. The lantern, which is open from W. by N. $\frac{1}{4}$ N. to S.E. $\frac{1}{4}$ S., in a northerly direction, is elevated 160 feet above the level of the sea; and the light will be seen at the distance of 6 leagues, and at lesser distances according to the state of the atmosphere; and to a near observer, in favourable circumstances, the light will not wholly disappear between the intervals of greatest brightness.

From Burgh Head to Fort George, at the entrance to Inverness, the coast lies about W. by N., $6\frac{1}{2}$ leagues. Between them lies the small tide-haven of Findhorn. It is about $4\frac{1}{2}$ miles west from Burgh Head. The shore is low and sandy, with Burgh Head Bay situated between them. This bay has from 5 to 7 fathoms in it, deepening to the northward. About 5 miles beyond Findhorn are some white sand-hills, and farther on is Inloch Castle. To the westward of this is the entrance to Nairn River. The shore here bends to the southward, and forms a kind of open bay. From Nairn River it turns N.W. $\frac{1}{4}$ N. to Whiteness, and thence rounds itself toward Fort George. Off this part, a *sand* stretches a good way out, called the *Whiting*, to the northward of which is the *middle ground*, having from 6 to 12 feet over it. Its west end bears E.N.E. from Fort George Point, distant $1\frac{1}{2}$ mile. There is a narrow passage between it and the Whiting; but the proper channel is on the northern side. The northern shore is rocky and steep. Having passed the middle, the northern shore suddenly winds round to the south, and forms a narrow strait between Fortrose Point and Fort George, which having passed, the channel runs in westerly towards Inverness. The southern shore is flat; and in the middle of the channel is a *long narrow sand*, having a passage on either side: but that to the northward has much the deeper water. S.W. of Fortrose, is a *small knoll*, of 2 fathoms, lying very near the shore. A dangerous *spit* also runs off to the northward of the eastern point of Inverness, reaching 'almost to the opposite shore. Vessels may anchor opposite Inverness, or go farther up Loch Beauly, towards the Red Castle; but those bound for Inverness should, if they are not well acquainted, take a pilot.

CALEDONIAN CANAL.—The eastern end of the Caledonian Canal is situate at Muirtown, near Inverness, and enters Loch Ness, at the distance of about 5 miles from Muirtown. The water in this loch is remarkably deep, having in some places 129 fathoms; thus opening a navigation for shipping, across Scotland, from the North Sea to the Atlantic Ocean. This canal was opened for shipping in 1825, and has a depth of 15 feet water in its shallowest parts.

CROMARTY and CHANONRY POINT LIGHTHOUSES.—*Edinburgh, April 15th, 1846.*—The Commissioners of the Northern Lighthouses hereby give notice, that a lighthouse has been erected upon Cromarty Point, in the County of Cromarty; and another upon Chanonry Point, in the County of Ross, the lights of which will be exhibited on the 15th of May, 1846, and every night thereafter, from sun-set to sun-rise. The following is a specification of the lighthouses, and the appearance of the lights:—

1. Cromarty Point lighthouse is situated in latitude $57^{\circ} 40' 58''$ north, and longitude $4^{\circ} 2' 7''$ west, within the entrance of Cromarty Frith. The light will be known to mariners as a fixed light, of a red colour. The lantern, which is open from W.N.W. round to S.E. by E. $\frac{1}{4}$ E., in a northerly direction, is elevated 50 feet above the level of the sea; and the light, being red, should not be expected to be seen beyond the distance of 9 miles, and at lesser distances according to the state of the atmosphere.

2. Chanonry Point light is situated in latitude $57^{\circ} 34' 32''$ north, and longitude $4^{\circ} 5' 28''$ west, at the entrance of the Frith, leading to Inverness and the Caledonian Canal. The light will be known to mariners as a fixed light, of the natural appearance. The lantern, which is open from W. $\frac{1}{4}$ N., round to N. by E., in a southerly direction, is elevated 40 feet above the level of the sea; and the light will be seen at the distance of 11 miles, and at lesser distances, according to the state of the atmosphere.

CROMARTY.—The entrance to Cromarty lies W.N.W., 23 miles from Cowsey

Point, and N.E. by E. $\frac{1}{2}$ E., about 2 leagues from Fort George, having an excellent harbour. Its entrance is nearly a mile wide, the water in it is deep,—from 30 to 22 fathoms; and the shores, excepting the south point, are clean. Close to the south point lies a *small rock*, called the *West Suter*, and on the opposite side lies another, called the *East Suter*; excepting these two rocks, you have nothing to fear.

The town of Cromarty stands upon a low point on the south side of the harbour, nearly 2 miles within the *West Suter*. The little bay on the east side of the town is shoal to the distance of $\frac{1}{2}$ a cable's length out, and the mark for clearing it is, the south end of the wood, near the houses of Inverbreckie, kept open to the north of Cromarty Point. This point is very steep, and there are 20 and 22 fathoms between it and the ferry-house on the opposite side.

Beyond the ferry-house is a large *sandy bay*, almost dry at low water. The low shingly bank of the ferry shut in with the *East Suter*, will lead clear off the edge of the banks for a full mile, but not farther, for the sand there runs out to the southward of this mark. The southern shore, for above 2 miles beyond Cromarty, is shoal, having 8 fathoms about 2 cables' length off; but farther westward, it shoals into the bay, at the south-western end of the harbour, where it dries farther out, and runs shoal toward the north bank, making the channel narrow as you advance toward Inverbreckie. You will find the deepest water by edging along the north bank, where, a little west of Cromarty, you will have 14 fathoms; thence shallowing half-way up towards Inverbreckie, then deepening again at Inverbreckie; but the south shore gradually shoals all the way up. Beyond Inverbreckie are 11 and 10 fathoms; a *sandy flat* continuing on both sides so far as Dingwall.

Near the *East Suter* are 16 and 18 fathoms water close to the shore, decreasing in depth to the southward. A little to the eastward lies a *shingly bank*, running off about a cable's length, with 5 fathoms on its edge, and shoal toward the shore. Its outer edge is steep, and with gales from the eastward, the sea breaks all over it.

E.N.E. $\frac{1}{2}$ E., 2 leagues from the entrance of Cromarty, lie the *Three Kings*; they are *small rocks*, about a mile from the shore, and appear at the last quarter ebb. To clear them bring Mackenzie's House, which stands on a rising ground to the southward of Cromarty, open, outside of the *East Suter*. From the *Three Kings* to Tarbet Ness, the course and distance are N.E. $\frac{1}{4}$ E., 6 miles. Except the *Three Kings*, the coast all the way from Cromarty to Tarbet Ness, is clean. Off Tarbet Ness are some *rocks*. The *Culloden Rock* also lies $\frac{1}{2}$ a mile N.E. from the Ness, with only 9 feet on it.

TARBET NESS LIGHTHOUSE.—In 1830, a lighthouse was erected upon Tarbet Ness, bearing from the *Three Kings* and *Kings' Sons*, N.E. $\frac{1}{4}$ E., distant 6 miles; from Halliman's Scars, at Cowsey Point, N.W. by N., 17 miles; from Clythe Ness S.W. by W. $\frac{1}{2}$ W., 31 miles, and from the *Culloden Rock* W. by S., a mile.

Tarbet Ness light is revolving or intermittent, suddenly appearing like a star of the first magnitude, and continuing in view 2 $\frac{1}{2}$ minutes, when it is suddenly eclipsed for $\frac{1}{2}$ a minute; thus producing its entire effect once every 3 minutes. It must however be observed, that within the Moray Frith, in a south-westerly direction from Tarbet Ness, where the light cannot be mistaken for any other on the coast, it will be permanently visible, until the mariner pass within a line drawn from Tarbet Ness, through a point $\frac{1}{2}$ a mile to seaward of the *Kings' Sons*, when it will be intercepted from his view by the high land of the coast. The interception of the light by the land will thus form a direction to avoid these dangerous rocks.

The lantern is open or glazed seaward, from S.W. $\frac{1}{2}$ W. to W. $\frac{1}{2}$ N., and is elevated 175 feet from the medium level of the sea. The light, in clear weather, will be seen at the distance of 5 or 6 leagues, and at lesser distances according to the state of the atmosphere.

Tarbet Ness is at once the northern boundary of the Moray Frith, and the southern extremity of the Frith of Tain, which it divides. In the latter the anchorage is good with all winds, excepting those from the east and N.E. N.W., 6 miles from Tarbet Ness, a *sandy flat* extends all across the Frith, rendering it unfit for shipping, especially to strangers. A *shoal* lies across the bar, dividing, and forming two channels; and has but 3 feet over it. The northern channel has 9 feet water; the southern 12 feet. When over the bar, and opposite the town of Tain, 2 miles from the shore, you will be in 7 fathoms. This is the entrance to Ockell River, and called Dornoch Loch. A pilot should always be obtained for this place.

From Tarbet Ness to the Ord of Caithness, the course is N.E., a little easterly, 17 miles; to Clythe Ness N.E. by E. $\frac{1}{2}$ E., 31 miles; and from Clythe Ness to Noss Head N.E. by E. and N.E. $\frac{1}{2}$ N., 11 miles.

From the bar of the Frith of Tain, the coast runs circularly toward the Ord of Caithness; some parts being rocky, and, therefore, must always have a good berth in passing; the Ord Head is high, steep, and rocky, the cliffs being almost perpendicular.

From ORD HEAD to CLYTHE NESS, a ragged rocky shore extends, without anchorage or harbour. Inland are the Paps of Caithness, two remarkable hills, with pointed tops, like sugar-loaves; these are visible a great way off, and point out your approach to this part. The course and distance from Ord Head to Clythe Ness, are E. by N., 15 miles.

A little to the southward of Clythe Ness is a *great rock*, above water, having several lesser ones round it. Close to it are from 9 to 12 fathoms; but it will always be prudent to give it a good berth.

NOSS HEAD* is remarkable for its high cliffs. At $1\frac{1}{2}$ mile to the southward of Noss Head is Staxigo, a tide-haven, where small vessels sometimes lie; and $1\frac{1}{2}$ mile farther is Wick, another small port; but generally, the shore between Clythe Ness and Noss Head is very bold, rugged, and rocky.

SINCLAIR'S BAY lies on the north side of Noss Head. It is large and of moderate depth, with clean ground, and can be resorted to with off-shore winds. Freswick Bay, to the N.N.E. of Noss Head, about 7 miles, is also a good place to stop a tide in.

DUNCANSBY HEAD.—At $10\frac{1}{2}$ miles N.N.E. $\frac{1}{2}$ E. from Noss Head, is Duncansby Head, the N.E. point of Scotland. It is formed of perpendicular cliffs, and appears very similar to Noss Head, so much so, that it is often mistaken for it. But Duncansby Head, as already observed, may always be distinguished from Noss Head by Duncansby Castle, or John o' Groats House, which is a high rock, seated over the land, and may, as before observed, be seen 15 miles off.

DIRECTIONS FOR SAILING FROM BUCHAN NESS TO DUNCANSBY HEAD, INCLUDING THE FRITHS OF MORAY AND TAIN, &c.

VESSELS bound from off Buchan Ness to the Moray Frith, should steer north or N.N.E., according to their distance from the shore, taking care to keep Buchan Ness in sight, outside of the outermost houses of Peterhead, in order to avoid Scotstown and Rattry Briggs; or if desirous of going near to the point of Rattry Briggs, bring Stirling Hill on with the innermost houses of Peterhead, and keep it so, until Mormond Hill comes open to the westward of Rattry Head; you will then be to the northward of that reef, and may steer N. by W. $\frac{1}{2}$ W., until Troop Head comes open outside of Kinnauld's Head, or until Kinnauld's Castle and lighthouse bear to the westward of W.N.W., either of which will lead clear of the Cairnbulg Scars.

Kinnauld's Head is steep-to; and the course and distance thence to the extremity of Halliman's Scars, or Covesea Skerries, are N.W. by W. $\frac{1}{2}$ W., 41 miles. The coast between Kinnauld's Head and Sear Nose is rising ground, and the shore steep, except the rocks before-mentioned, having 14 to 16 fathoms near it; and at the average distance of 3 or 4 miles off, are 20 to 24 fathoms, beyond which it deepens, with irregular soundings, mostly mud. Therefore, when working to windward, you should not stand into a less depth than 16 fathoms. Vessels may anchor in Aberdour Bay, and in all the bays between Troop Head and Sear Nose, with off-shore winds. In Spey Bay there is also good anchorage on clean ground, in every part.

* Noss Head.—A memorial has been forwarded by the merchants and ship-owners of Banff, to the Commissioners of Northern Lighthouses, pointing out the public advantage that would be derived from having a lighthouse erected on Noss Head.—*Banff, Feb. 18th, 1845.*

The course from off Halliman's Scars, or Covesea Skerries, to Cromarty, is W.N.W. $\frac{1}{2}$ W., and the distance 22 miles. If bound to Fort George, keep close to the north shore, all the way from the West Suter, until abreast of the Three Burns, off which a reef stretches a cable's length, which you must give a berth to. The coast here is high and rocky.

CROMARTY.—To sail into Cromarty Harbour, keep in mid-channel, till round Cromarty Point; then run about a mile to the westward along the south shore, and anchor, in 6 or 7 fathoms water, with a deep gulley on the south shore, up and down, and Cromarty Point bearing E.S.E. In turning, stand no nearer to the West Suter, and the bay eastward of the town, than to bring Cromarty Point on with the houses at Inverbreckie, or on the corner of the wood within the houses. The shore, from the Suter to the ferry, is steep; but when above the ferry, stand no nearer the bank, than to bring the low shingly point of the ferry near to the East Suter; which mark is good so far up as the anchoring-place, but no farther. The south shore, above the town, may be approached, by the lead, into 5 or 4 fathoms. All the ground, from the town to a mile above it, is good for anchoring.

Ships sailing from Cromarty, and bound to the north-eastward, must give the shore a berth after passing the East Suter, in order to avoid the bank before-mentioned; and, after having passed it, should keep Captain M'Kenzie's House open of the East Suter, until they have passed the Three Kings. From thence the shore may be approached to a cable's length, until near Tarbet Ness, to which must be given a berth of a mile at least, in order to avoid the Culloden Rock. This part will now be no longer dangerous to shipping, as the new lighthouse will lead you clear of all dangers.

If a vessel is situated at the distance of 3 or 4 miles off Buchan Ness, and bound through Pentland Frith, to the westward, the course will be N.N.E., 9 miles, until Kinnaird's lighthouse bears to the westward of N.W., in order the avoid the Rattray Briggs; the course and distance will then be N. $\frac{1}{2}$ W., about 24 leagues; but, with a scant wind from the eastward, and a high sea, you should steer north, to prevent your falling to leeward, and being obliged to bear-up for Cromarty.

TIDES FROM BUCHAN NESS TO DUNCANSBY HEAD.

IT is high water, full and change, at Buchan Ness, at 0h. 50m.; at Frasersburgh, 0h. 30m.; Bamff, 0h. 40m.; along shore to Cowsey Point, and at Cromarty, at 12h. 40m.; at Fort George and at Inverness, at 1h. 0m.; in the Frith of Tain, at 12h.; and at Sinclair's Bay, at 11h.

The rise of the tide is, at Buchan Ness, with springs, 13 feet, neaps 8; Frasersburgh, Bamff, and Cowsey Point, springs 15 feet, neaps 9 or 10; Fort George and Cromarty, springs 14 feet, neaps 9; Frith of Tain, springs 12 feet, neaps 7; and Sinclair's Bay, springs 9, neaps 5.

From Duncansby Head the stream diminishes in strength to the southward. Off Clythe Ness its velocity is 3 knots with springs, and $1\frac{1}{2}$ with neap-tides; continuing thus to the Ord Head. In the bays of Sinclair and Freswick there is no current, as they fall within its stream.

Off the entrance of Cromarty the stream runs at the rate of from $3\frac{1}{2}$ and 4 knots in springs, and 2 at neaps. At Fort George the current runs very strongly. Off Kinnaird's Head the stream runs about 2 knots in springs, and increases as it passes round, till off Peterhead, where it runs at the rate of 4 knots in springs, and $2\frac{1}{2}$ in neap-tides. But observe, that here the flood without sets partly on the shore, which, if not attended to, in light winds and a heavy sea, may prove dangerous. When in the offing, 6 or 7 miles eastward of Kinnaird's Head, the stream does not turn to the northward, until 3h. 15m.

FROM DUNCANSBY HEAD TO CAPE WRATH, THROUGH PENTLAND FRITH AND THE ORKNEYS.

Description of the Coast and Islands, &c.

From DUNCANSBY HEAD TO CAPE WRATH.—Pentland Frith lies between the coast of Caithness and the Orkney Islands, and is a well-frequented passage, leading from the North Sea to the Western Ocean.

The PENTLAND SKERRIES are some rocky islands, lying E. by N., distant $3\frac{1}{2}$ miles from Duncansby Head, the larger island being in latitude $58^{\circ} 42'$ north. Two lighthouses are erected on the Great Skerry, bearing nearly N.N.E. and S.S.W. of each other, distant 60 feet. The high light is 100 feet above the sea at high water, and the low light 80 feet. Both these lights are with lamps, and reflectors, and exhibit a constant, bright, and very conspicuous light. They are both fixed and stationary lights, visible 4 or 5 leagues off, when the weather is clear; and when in a line, lead clear of the foul ground to the southward of the Skerries.

The bearings and distances of the most conspicuous headlands, from the above lights, are the island of Copinsha N.E. by E. $\frac{1}{2}$ E., distant 14 miles; Roseness Head, which forms the east side of Holm Sound, N.E. $\frac{1}{2}$ N., distant 10 miles; the S.E. end of Barra, N.E. $\frac{3}{4}$ N., distant $8\frac{1}{2}$ miles; Halcrow Head, in South Ronaldsha, N.N.E. $\frac{1}{2}$ E., distant $3\frac{1}{2}$ miles; Barth Head N. $\frac{1}{2}$ W., distant $3\frac{1}{2}$ miles. Between this head and the lights, lies the *Lothar Rock*, distant from the lights $2\frac{1}{2}$ miles, and a little more westerly than the head.

The south end of the island of Swona bears from the lights N.N.W. $\frac{3}{4}$ W., distant 5 miles; the north end of the island Stroma N.W. by W., distant 6 miles; Brims Ness Head, or S.W. point of Hoy Walls, or Waes, N.W., distant 10 miles; Duncansby Head W. by S., distant $3\frac{1}{2}$ miles; Noss Head S.W. $\frac{3}{4}$ S., distant 12 miles; the Little Pentland Skerry bears south, a mile; and the outermost rock of the foul ground S.E. by E., distant $1\frac{1}{2}$ mile.

The coast, from the N.E. part of Duncansby Head to St. John's Head, runs somewhat in a circular direction, these two points bearing from each other N.W. by W. and S.E. by E., distant $5\frac{1}{2}$ miles; to the northward of St. John's Head is a *reef of rocks*, called the *Men of Mey*. From thence to Dunnet Head the distance is 5 miles, nearly, in the same direction.

DUNNET HEAD LIGHTHOUSE.—This lighthouse was first lighted October 1st, 1831. It exhibits a steady fixed light, from oil and reflectors, elevated 346 feet above the level of the sea, and appears like a star of the first magnitude, at the distance of 7 or 8 leagues; and at intermediate distances, according to the state of the atmosphere. The lighthouse, built of stone, and 45 feet high, is in latitude $58^{\circ} 41'$ north, bearing from the north end of the island of Stroma W. by N., distant $7\frac{1}{2}$ miles; from Hoy Head S.S.W., 13 miles; from the Stack and Skerry S. by E. $\frac{3}{4}$ E., 33 miles; and from Cape Wrath E. by S. $\frac{3}{4}$ S., 53 miles. In reference to these bearings, the light will be visible to the mariner, in a northerly direction, from S.E. $\frac{1}{2}$ E. to west.

DUNNET HEAD is high, steep, and rocky. W. $\frac{1}{2}$ N. from the lighthouse, distant 6 miles, is a little island, lying close to the main land, and usually called *Holburn Island*, the land between them bending inward, and forming Thurso Bay and Scrabster Road. Within both these, vessels may occasionally find anchorage.

W. by N., 5 miles from Holburn Island, is Brims Ness, from which a *rocky reef* runs out full $\frac{1}{2}$ a mile. The coast is rocky all along; and there are several *rocks*, above water, reaching from the Clett Rocks towards the Ness. W.N.W. $\frac{1}{4}$ W. from Dunnet light, distant 19 miles; and nearly N.W. by W., 9 miles from Brims Ness, is Strathy Head. Several small bays lie between; and the shore is generally high and rocky. West, a little northerly, 10 miles from Strathy Head, is Comb Island, having anchorage between it and the shore; but it is by no means a place of safety. N.W. by W., distant 7 miles from Comb Island, is Whiten Head; and between them are the Roan Islands and Kinlock Water, or the Kyle of Tongue. This is a spacious opening, within which

[NORTH SEA.]

lie the Rabbit Islands. Vessels proceeding here, will find the passage to the south-eastward of these islands safe, with from 10 to 17 fathoms between the Roan Islands and the shore, and 13, 14, and 12 fathoms very near to the Rabbits; but when advanced opposite to the village of Tongue, it becomes shallow; and Kinlock Water is only fit for boats. Whiten Head is a broad and rocky headland, with some few *rocks*, above water, about it; but they are steep-to, and without danger. When abreast of these, a W.S.W. course will open Loch Eribol.

LOCH ERIBOL is a wide and extensive branch of the sea, running in a S.W. by W. $\frac{1}{2}$ W. direction, 8 miles. In it is good anchorage, either to the northward of Chorie Island, or farther west, and nearer to the end of the Loch. The bottom is mud, and the depth from 10 to 14 fathoms. There are no rocks, except those near Eribol; and the high land of Ben Spinnie affords shelter to the anchorage. Off the entrance of the Loch there are the Cloven Rock, Duskerry, and Haa Island. It is not advisable to go inside of these, as many scattered rocks lie about them.

At 7 miles to the north-westward of Whiten Head, is a point of land, called Far-out Head, making the eastern point of Durness Kyle. There are several rocks about Far-out Head; but the middle of the Kyle is clear of danger, and has 10, 9, and 8 fathoms water within it. It is, however, too open to the north-eastward for vessels to anchor there in safety. On the north-western part of the entrance is Garran Island, with some rocks about it. The western land is high and rugged, having a remarkable barren appearance, and usually called the Forest. This extends all the way to Cape Wrath.

CAPE WRATH, or RATH, is a high and steep headland, having many rocks about it, and therefore must always have a wide berth given to it in passing. In 1828, a stone lighthouse, of a white appearance, was erected upon it, of which the Commissioners of the Northern Lighthouses published the following description:—Cape Wrath forms the north-western extremity of the main land of Scotland, in latitude $58^{\circ} 37'$ north, and longitude $5^{\circ} 1'$ west. It bears from Hoy Head W. $\frac{3}{4}$ N., distant 50 miles; from the Butt of the Lewis E.S.E. $\frac{1}{2}$ E., 40 miles; from the Stags S.W. by W. $\frac{1}{2}$ W., a mile; from the Nun Rock S.W. by S., 15 miles; and from the Stack and Skerry W.S.W. $\frac{1}{2}$ W., the former $35\frac{1}{2}$, and the latter 38 miles distant.

“This light will be known to mariners as a revolving light, exhibiting, from one and the same lantern, a light of the natural appearance, alternating or changing with one tinged red; which two kinds of light successively attain their most luminous effect every two minutes, and thereafter becoming gradually less luminous, are, to a distant observer, totally eclipsed for a short time.

“The lantern light-room is elevated 400 feet above the medium level of the sea. The light of the natural appearance will, in clear weather, be seen, like a star of the first magnitude, at the distance of 8 or 9 leagues, and at lesser distances according to the state of the atmosphere; but the red light, being somewhat obscured by the coloured shades, will not be seen at so great a distance.”

During a gale from the N.E., with a tremendous swell of the sea upon this part of Sutherland, the persons employed in erecting the lighthouse upon Cape Wrath, observed the waves breaking very high over the Nun Rock. The reef appeared to extend about a league S.S.W. and N.N.E., having in some places not more than 2 and $2\frac{1}{2}$ fathoms over it at low tides. The small island of Balag on with the Cape Land, leads right upon it. It seems to be connected with the Stack and Skerry by a fishing-bank, of from 25 to 30 fathoms.

THE STAGS lie off Cape Wrath N.E. by E. $\frac{1}{2}$ E., distant a mile, and are very dangerous; but the lighthouse, newly erected, will now always enable the mariner to give them a wide berth.

THE NUN ROCK and BANK.—North, 32° east from Cape Wrath, distant about 15 miles; north, 10° east from Far-out Head, distant 17 miles; and north, 6° west from Whiten Head, distant $21\frac{1}{2}$ miles, is the *Nun Rock*, which, according to Captain Ramage, lies with the little island of Balag just open of the land on the S.W. side of Cape Wrath; and with the eastern part of Whiten Head in a line with a round-topped hill, the Stack Rock just appearing above the horizon. The Nun Rock terminates in a point; upon which, with low tides, there are no more than 15 feet water. Within the distance of 6 yards from the centre of the rock, are $4\frac{1}{2}$, 5, 6, 7, and in one spot 11 fathoms; in another 16 fathoms: at the distance of 30 yards, are 18 fathoms. From the middle of

the rock, sounding round a radius of 80 yards, in all directions, there are from 6 to 12 fathoms; so irregular is the depth, that the same water is nowhere to be found twice within the space of a yard: extending the radius to 250 yards, it gives from 12 to 18 fathoms, with a similar irregularity.

From the shoalest part, in a westerly or southerly direction, the rock extends 500 yards, to the depth of from 19 to 24 fathoms; then clean ground and deep water; while at a similar distance eastward and northward, there are from 20 to 25 fathoms; then foul ground, with 25 fathoms to a considerable distance; the whole mass forming a rocky circle, about 1000 yards in diameter. This is situated upon the S.W. edge of an extensive bank of rotten rock, which runs to the N.E. and N. by E., full 10 miles, and to the eastward, so far as the Stack and Sule Skerry, where its breadth is about 6 miles; thus the length of this shoal is nearly 30 miles, and the water over it from 25 to 35 fathoms.

Between this bank and the coast of Scotland, the deepest water is 50 fathoms; the bottom commonly of coarse sand, gravel, and broken shells, separately or combined. Near the land, in less depth than 80 fathoms, black stones abound; and so they do round the Nun Rock.

Upon the rock it is high water, full and change, at 11 o'clock. Spring-tides set at the rate of 4 miles, and neaps 2 miles an hour. The flood runs to the eastward, first E.N.E.; middle east; and latter E.S.E.

E. $\frac{1}{2}$ S. from the Nun Rock, distant 19 miles; N. $\frac{1}{2}$ E., 26 miles from Strathy Head; and N.W., a little westerly, 25 miles from Hoy Head in the Orkneys, lies a rock, above water, called the *Stack*; and E. by N. from the Stack, 2 $\frac{1}{2}$ miles, is a similar one, called the *Sule Skerry*. The adjacent part is all rocky ground, with from 17 to 30 fathoms water, and forms the eastern part of the Nun Bank.

THE ORKNEY ISLANDS.

GENERAL REMARKS.—The Orkneys are a cluster of islands, lying to the northward of Duncansby Head, of various shapes and sizes, 26 of which are inhabited. The smaller islands are called *Holms*, and are chiefly used for pasturage. The principal islands are named as follows:—South Ronaldsha, Flota, Hoy Walls or Waes, Pomona, Burra, Copinsha, Shapinsha, Rowsa, Westra, Eda, Stronsa, Sanda, and North Ronaldsha, having several other small islands of inferior note between them. They are mostly separated by deep and navigable channels, through which mariners may pass in safety.

These islands are of irregular heights, being in some places high and prominent, and in others low and undistinguishable. Their eastern side lies nearly in a N.E. $\frac{1}{2}$ E. direction; and from the Skerry lights to Dennis Ness, the northern point of North Ronaldsha, the distance is about 46 miles. The northernmost islands are low and dangerous, being frequently enveloped in thick fogs, the atmosphere very rarely continuing clear for any considerable space of time. They are also subject to gales of a most tremendous description.

Vessels coming from the north-eastward will observe a lighthouse erected on the Start of Sanda, which may be seen 4 or 5 leagues. The high light of the Pentland Skerries will be visible at the equal distance; and Kinnaird's Head light can also be seen at a great way off in the offing. The mariner ought to be particularly careful not to mistake these lights one for another, for should he do so, the most fatal consequences may ensue. He will observe that the light on the Start is on a revolving principle, and is visible from every point of the compass. It is elevated 100 feet above the level of the sea, and may be distinguished from all others, as the reflectors are made to revolve once every two minutes, exhibiting light one minute, and disappearing the next—an effect fully sufficient for the purpose, as the light increases from darkness to full strength during one minute, and during the next declines in strength to total darkness. In clear weather, it will be visible 12 or 15 miles.

The currents in the North Sea should be particularly attended to, for the tides are not regular until you come near the Orkney and Shetland Isles. The tides also keep a regular course between the Orkneys and Shetland; only observing, you have to make an allowance for the time the tide runs longer, according to your offing; for in the middle, you have the tide 3 hours longer than near the shore.

THE EASTERN SIDE of the ORKNEYS.—The Pentland Skerries lie E. by N., distant $3\frac{1}{2}$ miles from Duncansby Head; and S.S.W. $\frac{1}{2}$ W., $2\frac{1}{2}$ miles from Old Head, in South Ronaldsha. Old Head is the south-eastern part of the island, and Grim Ness the north-eastern part: they bear from each other N.E. $\frac{1}{2}$ N. and S.W. $\frac{1}{2}$ S., distant 4 miles. Off Old Head E.S.E., distant $\frac{1}{2}$ of a mile, lies the Old Skerry: bring the North Kirk of South Ronaldsha open of Halcrow Head, and you will go on the outside of it.

From Old Head to Copinsha, the course and distance are N.E. by E. $\frac{1}{2}$ E., about 12 miles. Halcrow Head lies $1\frac{1}{2}$ mile N.E. by N. from Old Head. Between Halcrow Head and Grim Ness, off the middle of the bays of Lyths and Windwick, you may anchor, on clean ground, keeping Rose Ness on with, or rather a little outside of, Grim Ness. Between Halcrow Head and Grim Ness, the tide, during the first four hours of flood, runs to the northward; and from that time to the last of the ebb, the stream runs to the southward.

About N.E. $\frac{1}{2}$ E., distant $3\frac{1}{2}$ miles from Grim Ness, is Rose Ness. Between them are the entrances of Water Sound and Holm Sound: these are dangerous in an easterly gale and flood-tide, particularly Water Sound. The former lies between Ronaldsha and Burra Isles, and the latter between the islands Burra and Pomona. Between Grim Ness and the entrance of Water Sound, you may anchor, on clean ground, about $\frac{1}{2}$ a mile from the shore.

COPINSHA ISLAND extends nearly a mile N.E. and S.W., and is $\frac{1}{2}$ a mile broad. On the south side of this island a vessel may stop a tide, about $\frac{1}{2}$ a mile from the shore. About $\frac{1}{2}$ a mile N.N.W. of Copinsha, lies the Horse, with three fishing-beacons on it; and half-way between these is a small *sunken rock*, having only 9 feet on it at low water, spring-tides. You will avoid it, when going through this channel, by keeping to either side; but rather towards the Horse, because there is deep water within 20 yards of that island. As there is a *flat*, extending about a cable's length to the westward from the westernmost of the Holms of Copinsha, and a *rock*, lying $\frac{1}{2}$ of a mile to the eastward of the point of Air, visible only at low water, spring-tides, those who go through this channel will avoid the shoals on each side, by keeping $\frac{1}{2}$ of the distance from the Holms, and $\frac{3}{4}$ from the point of Air. In this passage are 3 fathoms at low water.

In sailing along the east side of Dear Ness, be sure to keep more than $\frac{1}{2}$ a mile from the shore, for there is a *flat* runs off from the Kirk of Dear Ness, about $\frac{1}{2}$ a mile to the E.S.E., which is almost all dry with spring-tides. A little to the northward of the outer end of this flat, and S.E. from Sandside, lies a *rock*, which dries at half-ebb.

MOUL HEAD, on the east side of the entrance of Dear Sound, lies $4\frac{1}{2}$ miles N. $\frac{1}{2}$ W. from Copinsha Island. Auskerry Island bears N.E., $7\frac{1}{2}$ miles from Copinsha Island; and Fair Isle bears E.N.E., distant about 17 leagues from it. Between Dear Ness and the island of Shapinsha, is the entrance to Kirkwall, which is the chief town in the Orkneys, having an old cathedral, and above 300 houses. It carries on a considerable trade.

A lighthouse is erected on the pier-head at Kirkwall, and exhibits a fixed light all night, from August till April.

About $\frac{1}{2}$ of a mile E.N.E. from the northernmost part of Auskerry Isle, lies a *sunken rock*, on which are 6 feet at low water; and about a cable's length from the N.W. part of the island, are three small *rocks*, two of which are always visible. Nearly a mile N.E. by N. from the N.W. part of Auskerry, and $\frac{3}{4}$ of a mile from the shore of Stronsa, lies a *rocky shoal*, called *Ingald*, appearing at 2 hours' ebb. Between the west end of this shoal and the shore, it almost dries with low spring ebbs. Those who go through between Auskerry and Stronsa, should keep in the middle of the passage, and they will thereby avoid all the dangers on both sides.

ROUSHOLM BAY, on the south side of Stronsa Island, is clean ground, and a convenient place to anchor in: near the west side of the bay is the safest part in the

winter-time. Mill Bay, on the east side of Stronsa, is also all clean ground, and convenient to stop a tide in. Off Rousholm Bay, and between Auskerry and Stronsa Islands, the stream, during the first three hours of flood, runs to the eastward; and from that time, until low water, it runs to the westward.

About 2 miles N.E. by E. $\frac{1}{2}$ E. from the S.E. part of Auskerry Isle, is Lamb Head, the S.E. point of Stronsa Island, remarkably high land; and a mile N.N.E. $\frac{1}{2}$ E. from Lamb Head, is Burrow Head, which is lofty. From Lamb Head, the Start, or N.E. point of Sanda Island, bears N.E. $\frac{1}{2}$ E., distant nearly 14 miles. Odness is about $2\frac{1}{2}$ miles N.N.E. $\frac{1}{2}$ E. from Lamb Head.

Above $\frac{1}{2}$ a mile N.N.E. from Odness, lies a *rock*, called the *Boa*, appearing only at spring-tides. By keeping Burrow Head without Odness, you will easily go clear of it on the east side; and to clear it on the north side, when going into Mill Bay, keep half-way between Odness and Grice Ness; then steer to the westward, and anchor, in $4\frac{1}{2}$ or 4 fathoms; the bottom being sand, and sand with shells.

About N.E. $\frac{1}{2}$ N., $6\frac{1}{2}$ miles from Odness, is Tres Ness, the S.E. point of the Isle of Sanda. At $1\frac{1}{2}$ mile N.E. $\frac{3}{4}$ E. from this point, are some *rocky shoals*, extending $1\frac{1}{2}$ mile from the end of Tres Ness, parts of which are visible at low water. To clear them on the east side, in sailing northward or southward, approach no nearer to Tres Ness than till the easternmost houses of Newark come on with the chapel of Arstas.

THE START lies 5 miles E. by N. from Tres Ness, with a lighthouse upon it, already described. Between them lies Newark Bay, in which you may anchor, on clean ground, within $\frac{1}{2}$ a mile of the shore; but you should avoid the east and west sides of the bay, which are foul and rocky. The most convenient part for anchoring in is, off the sand, with the house of Newark bearing W.N.W., distant $\frac{3}{4}$ of a mile.

BRIDE'S NESS, the S.E. point of North Ronaldsha, lies N.N.E. $\frac{1}{2}$ E., $5\frac{1}{2}$ miles from the Start. Between them lies the east entrance of North Ronaldsha Frith. About $1\frac{1}{2}$ mile S.E. $\frac{1}{2}$ E. from Bride's Ness, and $4\frac{1}{2}$ miles N.E. $\frac{1}{2}$ N. from the Start, lies the outer edge of the middle of the *Reef Dike*, which thence extends N.N.E. and S.S.W. about $\frac{3}{4}$ of a mile each way; and is, at its middle or broadest part, nearly $\frac{1}{2}$ a mile across. This is a *reef of sunken rocks*, having on its shallowest part, which is that next to Bride's Ness, only 5 feet at low water. As there are always breakers on it with an ebb, and often with a flood-tide, vessels can seldom go over it without great danger. Even when the water is smoothest, the rocks may easily be distinguished by a dark-coloured rippling tide running along them; and the depth, in approaching them on either side, shoals gradually.

DENNIS NESS, on which was formerly a lighthouse, but now a stone beacon, surmounted by a ball, lies N.E., $2\frac{1}{2}$ miles from Bride's Ness, and N.N.E. $\frac{3}{4}$ E., 8 miles from the Start. About $\frac{1}{2}$ a mile to the northward of Dennis Ness lies a *rock*, called *Selch Sherry*. A small part of it is always above water. Between this rock and the shore it is almost dry at low ebbs. The Altars of Linay extend above $\frac{1}{4}$ of a mile to the northward from the shore of the north-west part of the island. Ships, in passing by the south-east part of Dennis Ness, should give it a berth of about a cable's length. Off Dennis Ness, and thence southward, outside the north end of the Reef Dike, the stream, during the first 3 hours of the flood, runs S.S.W., and from that time till low water, it runs N.N.E.

About a mile northward from Dennis Ness, there is, even in the calmest weather, a rough breaking sea with the ebb-tide, which, with spring-tides, and westerly winds, becomes exceedingly violent. Between this rough sea and the shore, is an eddy during the flood-tide, in which a vessel may sometimes continue tacking until the tide is done.

WESTERN SIDE of the ORKNEYS.—The western points of the Orkney Islands may more readily be distinguished than those on the east, because Hoy Head will always be the first land made in coming in from the west. This is the highest of all the Orkneys, and called the Ward Hill of Hoy; its summit being 1620 feet above the level of the sea. Hoy Mouth, the sound or inlet of which Hoy Head forms the southern point, leads to Stromness, an excellent harbour, much resorted to by strangers, and the best for vessels bound out to the west; but a pilot should be obtained, if you are not thoroughly acquainted with the navigation.

THE HARBOUR OF STROMNESS is bounded on the S.W. by the Island of Gremsa, and on the opposite side by the main land. Between Gremsa and the main is the *Riddock Shoal*; it lies off the east end of Gremsa, and extends north and south, being nearer the island than to Orfer Head. It is composed of large stones, rent during tempestuous weather from the adjacent land. At extraordinary low tides there are not more than 12 feet water over it. In order to avoid this shoal in sailing from the southward, along the south and east sides of it, bring Stromness old kirk a sail's breadth open to the northward of the N.E. point of Gremsa, till the Keme of Hoy comes to the westward of Windbree House; then steer for the anchorage, at the back of the Holms of Kerston.

The distance from Hoy Head to Marwick Head is 12 miles N.E. by N. The coast between, from Brakeness, the north side of the entrance of Hoy Mouth, is all a bold cliffy shore, with deep water close to. From Marwick Head, about N.E., $1\frac{1}{2}$ mile, is a small island, called the Brough of Birsá; and thence E. $\frac{1}{2}$ S., 3 miles, is Costa Head, the northern extremity of the island Pomona.

The *North Shoal* is a *sunken rock*, with only 9 feet on its shoalest part, lying N. $\frac{1}{2}$ W., $6\frac{1}{2}$ miles from Marwick Head, and N. by E. $\frac{1}{2}$ E., 6 leagues from Hoy Head; that part of it, where the depth is less than 4 fathoms, is not above a cable's length long; and the water shoals gradually towards it on the east and south sides, from $\frac{1}{4}$ a mile distant. In fair weather the rippling of the tide may be seen on it, at some distance, and in blowing weather the sea always breaks over it. To avoid it on the east side, keep within 3 or 4 miles of the land. The Brough of Birsá may be passed at 2 cables' length distance.

ENHOLLOW SOUND.—To the S.E. of the North Shoal, is the entrance to Enhallow Sound, lying between Pomona and the isle of Rowssa, and which takes its name from an island in the middle of the sound. There is a fairway through, but the island should be left on the port or larboard side, and a pilot is required. In case of necessity, however, you may venture in, by keeping as nearly in mid-channel as possible, or rather more to the island side. A boat may here be had upon a proper signal.

From Costa Head, the north point of Pomona Island, to Noup Head, the N.W. point of the island of Westra, the bearing and distance are N.E., about 13 miles; and from thence to Moul Head the course is east, a little southerly, $6\frac{1}{2}$ miles.

WESTRA FEITH lies between the islands of Rowssa and Westra, and is a large inlet, in which there is plenty of room for working; but there is a *ridge of rocks* on the Westra side, called the *Sherries of Shea*. To avoid them, it will be proper to tack when half-way over from the western side. The latter is bold, and there is nothing to fear. In the day, and by reference to the chart, vessels may sail from the westward through this place, and out to the eastward, or from the eastward to the westward, without a pilot, by making a proper allowance for the tide; observing always, that the flood sets to the eastward and southward, through the islands, and the ebb contrary.

Runabrake is a *sunken rock*, with 2 fathoms over it, lying between North Ronaldsha and Papa Westra, and bearing from Moul Head S.E. by E. $\frac{1}{2}$ E., distant $8\frac{1}{2}$ miles, and N.E. $\frac{1}{2}$ N., nearly 5 miles from the Holms of Ire. The Holms of Ire are two small islands lying near a point of Sanda, having some *sunken rocks* to the north-eastward of them. The *Rive Rocks* lie off the N.W. point of Sanda, and dry at half-tide, extending out a full mile. With spring-tides the passage between the rocks and the shore completely dries.

FAIR ISLE lies about E. $\frac{1}{2}$ S., 8 leagues from Dennis Ness, and E. $\frac{1}{2}$ N., 10 leagues from the Isle light. It extends N.N.E. $\frac{1}{2}$ E. and S.S.W. $\frac{1}{2}$ W., 2 miles, and is $\frac{1}{2}$ a mile broad at its north end. The land of this island is very high, and the water, within $\frac{1}{2}$ a cable's length of the shore, is deep. The only place where a vessel can moor, and that only in the summer-time, is a small cove on the east side of the island, called the North Haven, capable of containing only one or two small vessels at a time. Near to the north end of this cove is a *rock*, always above water, on the north end of which you must make fast. There is a *rock* on the port or larboard side going in, which appears at low water; therefore you should keep in the middle of the passage. The least water in this cove is 12 feet.*

* Krusenstern, by good observation, makes the latitude of Fair Island, $59^{\circ} 32' 46''$, and the highest point, lately by Mr. Thomas, in latitude $59^{\circ} 32' 54''$, and longitude $1^{\circ} 37' 50''$ west.

It is high water at Fair Island about 11h. 15m. Ordinary spring-tides rise about 4 feet; extraordinary springs about 6, and neap-tides seldom more than 2 feet. The flood-tide commonly sets in from the N.W., dividing near the shore, on the N.W. part of the island, and running along the north and south ends of it, forms a large eddy on the east side. The channel between Fair Island and the Shetlands is about 20 miles wide; spring-tides run at the rate of from 6 to 7 miles an hour, but neap-tides not more than 2.

DIRECTIONS FOR SAILING THROUGH PENTLAND FRITH AND THE ORKNEYS.

THE passage through the Pentland Frith is either between Duncansby Head and the south side of the Isle of Stroma, or, which is generally preferred, between the Pentland Skerries and the north side of that island. Your course and distance from the entrance of the Frith, to a fair berth between Stroma and Swona, is N.N.W. $\frac{1}{2}$ W., 5 miles; and thence to the westernmost part of the Frith, between Dunnet Head on the coast of Caithness, and Turness on Hoy Walls, N.W. by W. $\frac{1}{2}$ W., about 9 miles; then running on W.N.W. $\frac{1}{2}$ N. or N.W. by W., you will go clear of the Sule Skerry, Stack, and Nun Rock, on the starboard, and Cape Wrath on the port or larboard; but you should keep a good look-out for the latter danger, lying N. 32° east from Cape Wrath, distant about 15 miles, the situation and particulars of which are given in page 106. Between the Frith and Cape Wrath, no place is adapted for the shelter or accommodation of a vessel in safety, better than Loch Eribol. Here the ground is clean. In going in, you will leave the Haa Island on your starboard side, and the Whiten Head on your port or larboard. This latter is a bluff point, of white appearance, making two ascents like steps. You may, near this side, run up to the island Chorrie, where the anchorage is good, with 10, 12, and 14 fathoms, and large enough for numerous vessels, the best riding being athwart of two rivulets running from a hill on the west side of the loch.

With a neap-tide, the stream in Pentland Frith is generally so weak, that it will not carry a vessel much out of her direct course, and, therefore, it need not be regarded, unless there happens to be but little wind. The spring-tides, when strongest, run about 9 miles in an hour, and, therefore, their strength, direction, and time of running, ought to be particularly observed in shaping your course. As the ebb tide sets to the northward, and the flood-tide to the southward, it is necessary you should, in going to the westward with an ebb-tide, keep nearer to Duncansby Head and Stroma than to the Skerries and Swona; and in proceeding to the eastward with a flood-tide, you should keep nearer to Swona than to Stroma, unless the wind be scant in the southern quarter; in which case you should pass close by Stroma, in order to enable you to weather the Pentland Skerries.

As the tide runs nearly 8 hours longer in the middle of the Frith, than it does near the sides, ships, in passing through it, ought to avail themselves of that difference. If, for instance, when you come into the Frith from the southward, you find that the flood-tide is against you, your best way will be between the Caithness shore and Stroma Isle. In going through this passage, it is necessary for you to remember, that about a cable's length S.S.W. from the S.W. point of Stroma Isle, lies a *small rock*, which appears at about half-ebb; and also that from St. John's Head, in Caithness, a *rocky ledge* runs off N.N.E., called the Men of Mey, about $\frac{1}{2}$ of a mile. If the tide prove unfavourable to you before you get through this passage, you may obtain a temporary anchorage in Gill's Bay to the eastward of St. John's Head, on clean ground, and out of the tide-way, in from 3 to 6 fathoms.

Notwithstanding this island is so small, rocky, and apparently barren, it contains a population of more than 200 people, who, far from being deficient in the necessaries of life, are able to furnish a supply to any vessel having occasion to touch there.

As the tide, on its coming within $\frac{1}{4}$ of a mile of the middle of Stroma and Swona, divides into two branches which, after passing their north and south ends, run to a considerable distance beyond the islands before they join again, ships that do not get through the Frith before the tide turns against them, may be kept under weigh in the eddies; or may, with a flood-tide, anchor on the east side of Stroma and Swona. About $\frac{1}{4}$ a mile off the middle of Stroma you may anchor, in 16 fathoms; the bottom being a mixture of sand and shells. The eddy here extends about a mile to the eastward of the island, where the two streams which form it unite again. About a cable's length off the North Haven, on the east side of Swona, you may anchor, in from 16 to 20 fathoms, in an eddy which extends about $1\frac{1}{4}$ mile to the eastward, the bottom being smooth and rocky. From hence the water deepens very fast to the eastward. The North Haven is a narrow creek, or cove, near the northernmost house on the east side of the island of Swona.

Eddies are formed on the west side of Stroma and Swona, with the ebb-tide, which are as extensive as those formed on the east sides with the flood-tide, if not more so; but there is no anchoring on the west side of either island. Half a cable's length from the west side of Swona, lies a *rock*, called the *Westerbow*, seen only with very low spring-tides.

Near the south end of Swona with a flood-tide, and also near to the north ends of Swona and Stroma with an ebb-tide, are *whirlpools*, but never dangerous to ships. From the north end of Stroma, westward, there is, during the ebb-tide, always a great swelling sea, and frequently breakers, even in the calmest weather. These are called the *Swelky* of Stroma, and ought to be avoided. From the south end of Stroma, westward, there is also, with a flood-tide, a rough breaking sea on the *Men of Mey*. Off *Duncansby Head* there is a rough breaking part of the sea, with spring-tides, called the *Bore of Duncansby*, often proving fatal to boats; but never so dangerous as the former.

In proceeding for *Pentland Frith* from the north-eastward, you must not approach *Old Head* on the east side of *South Ronaldsha*, within less than $\frac{1}{4}$ a mile; for *Old Skerry* lies about $\frac{1}{4}$ of a mile E.S.E. from the head. You will clear this rock, by keeping the north kirk of *South Ronaldsha*, or the house of *Cara*, in sight outside of *Halcrow Head*.

The *Lothar* is a *rock* which lies off the south-west point of *South Ronaldsha*, and is never wholly covered but at high water; it may then be distinguished by the rippling of the tide, or the breakers on the middle of it. By keeping $\frac{1}{4}$ a mile from the shore of *South Ronaldsha*, when going to the westward with an ebb-tide, and a mile from the shore, when going to the eastward with a flood-tide, the stream will carry you clear of it. If you should be so near the land that you cannot go to the southward of it, you may safely keep the middle of the channel. Between it and *South Ronaldsha*, the water, though always rough and breaking, even in the calmest weather, is deep enough for any vessel.

Your courses through the *Frith*, between *South Ronaldsha*, *Swona*, and *South Walls*, on the north side, and *Pentland Skerries*, *Stroma*, and *Dunnet Head*, on the south side, are as before mentioned; but you must always allow for the operation of the tide: the flood-tide setting to the southward, and the ebb to the northward. If you meet with the flood-tide before you get so far to the westward as the eddy on the east side of *Swona*, you may keep under weigh in *Liddel's Eddy* on the south side of *South Ronaldsha*; or, if there be not sufficient wind to work the ship, you may anchor about half-way between *South Ronaldsha* and the *Great Pentland Skerry*, the west end of the *Great Skerry* bearing S. by W., in 17 or 18 fathoms, on a bottom of sand and shells. In keeping under sail in this, and also in all the other eddies, you must be particularly careful not to go beyond its boundary, lest you should be hurried away by the rapidity of the tide, and thereby prevented from fetching into it again. The boundary is easily distinguished. This eddy, or westward stream, begins before it is half-flood on the shore, and extends by degrees southward. About the fourth hour of the flood, it spreads half-way to the *Great Pentland Skerry*, and near to the latter end of the tide, it approaches within a cable's length of the *Skerries*.

There is an eddy also on the east side of *Pentland Skerries*, in which you may anchor with a flood-tide. The streams which form it do not join again, but become wider as they proceed, until they are lost in the open sea. About $\frac{1}{4}$ a mile S.S.E. from the

Little Skerry, are 14 fathoms. You may anchor in this eddy, with the following marks, viz.:—the middle of the Little Skerry on with the middle of the Great Skerry; or the east end of the Great Skerry on with Sandy Hill, in South Ronaldsha; or the west end of the Little Skerry on with the Hill of Hoy; and the east end of the Great Skerry on with the Wart Hill of Orfer. The ground is a mixture of sand and shells. There is also an eddy on the west side of the Skerries with an ebb-tide; but it is very small, not extending above $\frac{1}{4}$ of a mile from the Great Skerry.

About a mile S.E. from the east side of the Great Pentland Skerry, and $\frac{3}{4}$ of a mile E. by N. from the Little Skerry, lies Cleta Skerry. Its top is always above water. About half-way between Cleta Skerry and the Little Skerry, lies *Lotha Sherry*, a very dangerous rock, appearing at half-ebb. The water is shoal all the way from Cleta to the Little Skerry; but Lotha only appears above water.

NOTE.—In most of the eddies, especially those on the east side of Stroma and Swona Isles, you must be sure, with a spring-tide, to have your anchor up before the ebb begins to run, otherwise you will be obliged to cut or slip your cable, and afterwards find it very difficult to clear the island.

If, from the southward, you are crossing the east end of Pentland Frith for the Orkneys, with an ebb-tide, you should pass near to the west side of Pentland Skerry, to prevent your being carried by the stream to the westward of Swona, for there the ebb would be against you. In crossing from the north to the south, with a flood-tide, you should pass as near to Swona as you can, that the tide may afterwards be more in your favour. In crossing the east end of the Frith, either way, with a flood-tide, you should endeavour to get into the eddies of Stroma and Swona, in order to enable you to make use of the tide with greater advantage. When crossing Pentland Frith with the latter end of a tide, allow the stream to carry you as far as possible, as you will thereby have the greater advantage from the succeeding tide.

If coming from the westward, through the Pentland Frith, the lights will be useful when a ship is in the fairway; for by keeping them on the port or larboard bow or side, they will lead you to the S.S.E., into the North Sea.

When sailing along the east side of Dear Ness, be sure to keep more than $\frac{1}{2}$ a mile from shore, as a flat runs off from the Kirk of Dear Ness, about $\frac{1}{2}$ a mile E.S.E., which is almost dry with spring-tides. A little to the northward of the outer end of this flat, and S.E. from Sand Side, lies a rock, which is dry at half-ebb.

Stronsa Frith lies between Moul Head and the islands of Auskerry and Stronsa. It is 5 miles wide; and a N. by W. course will carry you in mid-way, clear of danger, until you get abreast of Greenholm Island.

In coming from the north-eastward, if mariners happen to fall in with Burrow, or Lamb Head, with an ebb-tide, and wish to go northward, they should steer N.E. by E., supposing the wind from seaward, until Dennis Ness, upon which stands a beacon, with a ball on its top, (formerly the lighthouse,) bears on their lee quarter, when they may vary their course as convenient. If the weather should be hazy, and you get near North Ronaldsha before seeing the land, then it will be prudent to go to the northward of the island, for both flood and ebb-tides will assist you in so doing; and having passed North Ronaldsha, and bound to the south-westward, be observant of the tides. In coming from the south-eastward, it will be proper to keep a good look-out for the Start light, when your course may be safely directed, steering by the direction of the light, and being careful to allow for the tides, because the ebb sets directly on Papa Westra, and the flood the contrary.

NORTH RONALDSHA FRITH.—In sailing to the westward, between Sanda and North Ronaldsha, with a flood-tide, you should proceed through the middle of the Frith, and the tide, if the wind fails, will carry you to the southward of the Reef Dike. If the ebb-tide is against you, in going through from the westward, you should keep as close to the shore of Sanda as the flats will permit, for there the stream is weakest, and may be more easily thwarted when occasion requires. If you happen to be near the south side of North Ronaldsha, and find it impossible to pass to the southward of the Reef Dike, you may safely go through between Bride's Ness and the rock, by keeping about 2 cables' length from the Ness. If, when between the Reef Dike and North Ronaldsha, you be doubtful whether you can clear Dennis Ness, especially with a flood-tide, you may tack, or come to an anchor in Lincelot

[NORTH SEA.]

Bay, on clean ground, rather than attempt going to the southward of the island, because there the flood runs directly towards and over the shoal.

There are many passages through the islands of Orkney, in which are a great number of excellent harbours; but, if you are not acquainted, it will always be advisable to take a pilot. In the Orkneys you may also procure a pilot for the Highlands and western islands of Scotland, the Irish Sea, Liverpool, Dublin, and the Shetlands.

THE SHETLAND ISLANDS.

Description of the Land, &c.

THE Shetland Islands run nearly in a N.E. by N. and S.W. by S. direction, the distance being about 60 miles from Sumburg, or Sumbro' Head, to Lamba Ness. The general appearance of the Shetland Islands is rugged, black, and barren, there being neither tree nor shrub to be seen. The coasts are commonly steep and precipitous, and the eastern shores comparatively low; but the western sides are lofty, ragged, and broken. The hills of Mainland are not remarkably high, but run in three ridges, Ronas Hill, at the N.W. corner of Mainland, appearing the highest. Vast detached rocks surround the islands, having the appearance of pillars; and the sea, in various places, has hollowed out arches and caverns in the rocks, of the most tremendous and magnificent nature. Fetlar Island is supposed to abound with iron ore; and a rock there is said to affect the compass.

The EASTERN SIDE of the SHETLANDS.—Sumbro' Head is the S.E. extremity of Shetland. Upon this point, lying in latitude $59^{\circ} 51' 20''$ north, and longitude $1^{\circ} 16' 27''$ west, a lighthouse is erected, bearing from Hang Cliff Head, in Noss Island, S.W. $\frac{3}{4}$ W., distant 19 miles; from Fair Island N.E. by E. $\frac{1}{4}$ E., 21 miles; and from Foul Island S.S.E. $\frac{1}{4}$ E., 28 miles. In reference to these bearings, the light will be visible to the mariner from the southward, between Noss and Foul Islands.

This light will be known to mariners as a stationary or fixed light, from oil, with reflectors. The lantern is elevated 300 feet above the medium level of the sea, and may be seen like a star of the first magnitude, at the distance of 6 or 7 leagues, and from intermediate distances according to the state of the atmosphere.*

From Sumbro' Head to Mousa Island, the course is about N.E. $\frac{3}{4}$ E., and the distance 3 leagues; between them are several inlets, only frequented by small vessels in the summer-time. About 8 miles N.E. $\frac{1}{4}$ N. from Sumbro' Head is Cumla Ness, between Lewenwick and Sandwick Bays. Sandwick is on the eastern side, and sheltered by a rocky point, called No Ness: here is good anchorage, in from 12 to 4 fathoms, and there is the same depth in Lewenwick Bay; the shores of both bays are rocky.

To the north-eastward of No Ness lies Musa, or Mousa Island; this is about a mile long, and rocky. Between it and the main is a passage, leading to Aith Voe, having from 20 to 15 fathoms in it, called Mousa Sound.

Aith Voe is fit only for small vessels, having not more than 10 and 12 feet water in it; it is well sheltered by Haly Ness, between which also, and Mousa Island, is a good channel.

BRASSA or BRESSA.—From Mousa Island to the Bard of Brassa, the course and distance are N.E. $\frac{1}{4}$ E., 7 miles. The entrance of Brassa Sound, which leads up to Lerwick, the principal village of Shetland, is easily to be known by the Islands of Brassa and Noss; the former is remarkably high in the middle, and goes sloping down to the westward; but to the eastward it ends in a perpendicular cliff. The Isle of Noss is to the eastward of Brassa, and has an acclivity from the west towards the east,

* A modern writer (Dr. Mac Culloch) is of opinion, that the situation of this lighthouse is too high; and that during thick weather and easterly winds, it must be involved in fogs and mists, by which it will be obscured, and rendered invisible.

terminating with a high cliff that hangs over the sea, and therefore called Hang Cliff. Its situation is in latitude $68^{\circ} 8'$ north, and longitude (according to Mr. Thomas) $1^{\circ} 0' 30''$ west.

BRASSA SOUND lies between Brassa Island and the main land. Its entrance is wide, and free from danger; but as you advance, it narrows, being, between Kirkoby Ness and Nab Point, not $\frac{1}{2}$ a mile broad; farther on, between the land of Hogan and Rovey Head, it becomes still narrower; the distance there from land is scarcely 2 cables' length; nevertheless, the channel between is clear of danger, and has a depth of 3 and $2\frac{1}{2}$ fathoms. Off Kirkoby Ness are some *rocks* under water; and on the opposite side, called the Nab Point, are others, which must carefully be avoided. On the port or larboard shore stands the town and castle of Lerwick, in latitude $60^{\circ} 9' 22''$, and longitude $1^{\circ} 8' 41''$ west, built on the rocks, before which is good anchorage, in 8 or 10 fathoms. This is the principal town in the Shetland Islands; its population is computed at about 2000; it carries on a considerable trade, and is the chief rendezvous of vessels employed in the adjacent fisheries. Near the north end of the town stands Fort Charlotte, mounting 18 guns. Two packets sail from hence to Leith, having good cabins and fair accommodations. It is high water at Lerwick, full and change, at 10h. 30m. Spring-tides rise 6 feet, neaps 4.

To the N.N.E. of Lerwick Castle, about $1\frac{1}{2}$ mile, is the *Loofabar Rock*, with only 3 feet water on it. It lies nearly in the middle of the channel, and W. by S. from the Holm of Cruister. Close to it are 3 fathoms; and between it and the port or larboard shore, 5, 6, and 7 fathoms. This is the best and proper channel for all large vessels; for between the Loofabar and the Holm of Cruister, the water is shallow, there being only 2 fathoms midway. Between the Holm of Cruister and the starboard shore, is a narrow passage for boats, with 3 and 4 feet in it. The port or larboard shore is rocky. From Lerwick round North Ness, towards Skibdock and Greymister, the shore is also rocky. At Greymister is a *sandy beach*, where you may get fresh water. About $\frac{1}{2}$ of a mile N.N.E. from Loofabar, is a *patch*, with only 9 feet water on it, having a channel, of $3\frac{1}{2}$ to 4 fathoms, to the westward, and $2\frac{1}{2}$ fathoms between it and Hogan Point; and near Rovey Head lie two small islands. A *sandy spit* runs out from the Point of Hogan; and between it and the opposite shore are $2\frac{1}{2}$ and $3\frac{1}{2}$ fathoms, deepening as you advance towards Green Head, to 4 and $4\frac{1}{2}$ fathoms; and thence, northward, to 6, 9, 12, and 23 fathoms, off Rovey Head. In going to the northward from Lerwick, you should not venture without a pilot.

CATFRITH VOE is the general name for the entrance to four places of good anchorage, called the Four Voes, or Deal Voe, Laxfrith Voe, Wadbister Voe, and Catfrith Voe. They are all clean, and have good anchorage; but, in your way towards them, on the port or larboard side, are a number of dangerous *rocks*, which render the approaches to Deal Voe very difficult. E. by S. from Hawk's Ness, $\frac{3}{4}$ of a mile, and south from Glitness Island, distant $\frac{1}{2}$ a mile, lies the *Unicorn Reef*; bring the south end of Glitness N.W. by W. or W.N.W., and steer for it. Passing near it, you may enter Catfrith in safety. At the entrance of Wadbister Voe is a *patch*, of 9 feet, with a good channel on each side of it; and nearly a mile above this you will have 11 or 12 fathoms water, and be well sheltered. The main land from behind Glitness to Eswick, is all steep and rocky; but off the Mull of Eswick, is the How Stack, a small green island, lying S.S.W., nearly a mile from the Mull. N.E. by N. from Eswick Mull, distant $2\frac{1}{2}$ miles, is Hog Island, with some *rocks* to the eastward of it. To the northward of Hog Island is Stava Ness, between which and Dragon Ness, is the entrance to Oure, or Doury Voe. This is a large and safe bay, running in full 3 miles to the westward, and having several places with good anchorages within it. On the southern side is Ballester Holm, and beyond it some *sunken rocks*; and farther to the westward is Swarta, or Black Islet. It is advisable to sail near the northern or starboard shore, which is free from danger, with from 22 to 10 fathoms water. Directly before the entrance to Doury Voe lie the Whalsey, and other islands, with channels between them; but they are very dangerous, and little frequented, except by the natives. The southern ends of the Whalsey are encumbered by *rocky reefs*; and there are *three rocks*, called the *Rumble*, *Grief*, and *Eastling*, and Four Holms of Isbister, lying considerably out to the eastward of the Whalsey; these are all above water, with passages between each other, and also between them and the Whalsey.

Between the Mull of Eswick and the S.E. part of Whalsey Island, are the following

rocks, which lie from 2 to 3 miles from the main land, viz :—The *Hoga Baas*, *East Fladdecap*, *West Fladdecap*, *Little Billian*, and the *Outer*, *Middle*, and *Inner Voder*; all of which have channels between them, of from 20 to 30 fathoms water. The *Outer Voder* lies E. by N. $\frac{1}{2}$ N., $1\frac{1}{2}$ mile from the Mull of Eswick, between which, lie the *Inner* and *Middle Voder*. *Little Billian* lies E. $\frac{1}{2}$ N., 2 miles from the Mull; a mile E. by N. $\frac{1}{2}$ N. from which lies the *West Fladdecap*; and a mile farther, in the same direction, lies the *East Fladdecap*. The *Hoga Baas* lies $\frac{1}{2}$ a mile from the S.E. part of *Whalsey*, having a channel, of 30 fathoms water, between them. *Two rocks*, above water, lie off to the north-east end of the *Whalsey*: the outer one is named the *Shaw Holm*. The south end of *Whalsey Island* lies N.N.E. $\frac{1}{2}$ E., nearly 11 miles from *Hang Cliff*, the island being $4\frac{1}{2}$ miles long, and 2 miles broad.

WHALSEY SOUND.—Between the west side of *Whalsey* and *Great Longa Island*, is a passage into *Doury Voe*, named *Whalsey Sound*. In mid-channel are from 8 to 15 fathoms, except near the southern entrance, where there is a *bar*, with only 3 fathoms on it at low water.

OUT SKERRIES.—East, about $3\frac{1}{2}$ miles from the north end of *Whalsey Island*, and N.E. $\frac{1}{2}$ E., 17 miles from *Hang Cliff*, lie the south end of a small cluster of islands, called the *Out Skerries*. In the centre of the three largest islands, named *Housay*, *Gruna*, and *Brury*, there is good anchorage for small vessels; but a pilot is requisite. Several *rocks* lie to the southward and westward of them; but they all appear above water. N. by W. $\frac{1}{2}$ W., $2\frac{1}{2}$ miles from the south end of *Houray* lies the *Muckle Skerry*, or *Great Rock*, which is always above water. Midway between the *Muckle Skerry* and the islands off the south end of the *Outer Skerry*, lie the *Little Skerry* and *Vong Islets*, both surrounded with *rocks*. N.W. by W. from *Muckle Skerry*, about $5\frac{1}{2}$ miles, lies *Lunna Holm*, forming the southern point of entrance to the *Sound of Yell*.

Between *Doury Voe* and *Lunna Holm*, is *Vidlon Voe*, which runs to the southward, and forms a good harbour in case of necessity, with deep-water. Along the main land from *Lunna Holm*, westward, are numerous voes, or inlets, with excellent harbours. Numerous islands also lie scattered about this part, around which are good and safe passages, with deep-water.

About 2 miles N.E. by N. from *Lunna Holm*, lies the south-eastern point of *Yell Island*. Some *rocks* lie off to the eastward, which must always have a berth given to them in passing. To the westward of this point is *Burra Voe*, and a little farther, *Hamma Voe*, both having good riding for small vessels; but the latter place is most commodious, and much to be preferred.

YELL ISLAND lies in a N.N.E. $\frac{1}{2}$ E. and S.S.W. $\frac{1}{2}$ W. direction, being about 15 miles long. On its eastern side are *Refrith* and *Basta Voes*, two havens, with good anchorages, where vessels may ride in perfect safety; indeed, *Basta Voe* may be considered one of the finest harbours in *Shetland*. Off the entrance to *Refrith Voe* lies the *Island of Hascosea*, and between it and the eastern point of the voe, there is a *rocky islet*, of small dimensions, called *Hascosea Baa*, with 7 fathoms water around it. The best passage into the voe is to the southward of the *Baa*.

FETLAR ISLAND lies to the eastward of *Hascosea*, nearly a mile, the channel between them being named *Colgrave Sound*. *Fetlar* is a square-formed island, measuring about 5 miles from east to west, but not so much from north to south. On its southern side is *Tresta Bay*, open to the southward, and otherwise shoaly and dangerous. At its eastern side is *Funzie*, another small haven, of no note. From thence the shore is steep and rocky to *Strandburgh Ness*, the N.E. part of the island. To the westward of *Strandburgh Ness* is *Gruting Bay*, which is extensive, and free from danger, with from 5 to 15 fathoms water in it; but it is open to the north-eastward.

UNST ISLAND lies directly to the northward of *Fetlar Island*, its south-eastern point being N. $\frac{1}{2}$ W., distant 4 miles from *Strandburgh Ness*. This island is about 10 miles long, and 4 miles broad, lying in a N.E. and S.W. direction. At its southern end is *Skuda Sound*, a safe and good haven, formed between the islands of *Unst* and *Uya Islands*. Off the southern end of *Uya Island* is *Wedderholm Island* surrounded by rocks near its shores; but the passage between it and *Uya* is clean, though narrow, and has 4 fathoms water in it. *Haaf Grunie Island* is to the eastward, and has a *sunken rock* off its northern end, which, although there is sufficient water over it at all times, and consequently is not dangerous, yet, in a gale of wind, the sea frequently

breaks over it. There is a hill, called Vallafield, which rises rather more than a mile from the northern extremity of Unst, and extends parallel to the western shore. It is 697 feet high. At right angles with this hill stands Crossfield, nearly in the middle of the island. To the north stands Saxavord, about 938 feet high. This is the loftiest mountain, and may be seen 40 miles off, in clear weather. Vord, or Vord Hill, runs in the direction of the eastern coast. Among these hills are several tracts of level fertile ground; and the highest hill is covered with a sort of black moss. The headlands rise to the height of 60 and 70 fathoms; but the shores of the bays are low and sandy. Round the island are several curious caves; and under Saxavord Hill is a magnificent arch, 300 feet in length, and of considerable height, through which a boat may easily pass. The N.E. end of Unst is called Lamba Ness, in latitude $60^{\circ} 49'$ north, and longitude $0^{\circ} 45' 30''$ west.

THE VEER REEF is a nest of *rocks*, lying to the north-eastward of Mu Ness Point, distant a mile, over which the sea constantly breaks. Off Mu Ness Point is a *reef of rocks*, under water; it will, therefore, be requisite to give the point a good berth. Ham Creek lies behind Mu Ness Point, where a small vessel may ride, in 10 feet water.

BALTA SOUND is situated between the islands of Balta and Unst, the south point of the island, being in latitude $60^{\circ} 44' 30''$ north, and longitude $0^{\circ} 48'$ west. There is a small island to the westward of the south end of Balta, called Hunie, or Hoony; but no passage between it and Unst, except for boats, at high water. The entrance between Hoony and Balta is easy, and clear of danger, having from 15 to 16 fathoms in it. You may know this place by the flag-staff on the island of Balta; and when within, you will find the inner part of the harbour very commodious and secure. Here are several convenient beaches, where your vessel, if leaky, may be thoroughly repaired. In summer, vessels intending to go out by the north passage, frequently run in here, and anchor, bringing Mr. Edmonstone's large house on with a small house standing on the southern point of the inner harbour, bearing about N.W.; and the east point of Fetlar open of the S.W. point of Balta Island. The passage to the northward of Balta, between it and Sweeney Ness, is narrow; and Balta north point has a *rocky reef* adjoining it, which renders this northern passage somewhat dangerous. It is high water in Balta Sound, full and change, at 9h. 45m.; springs rise $6\frac{1}{2}$ feet, neaps 3.

THE WESTERN SIDE of the SHETLANDS.—Scat Ness is a mile to the westward of Sumbro' Head. Between them the land bends in to the northward, forming a bay, called West Voe, in which vessels may ride, in 6, 7, and 8 fathoms; but this place is unsheltered, and completely open to the southward; yet it may often be convenient to run in here, when Quendal Bay would be too open; for there will be no difficulty in beating out of it, unless the wind should come round to the southward. Off Scat Ness lies Horse Island, which is the southernmost land of all the Shetlands. N. by W., a mile from Scat Ness, is Cross Island; between which and the main is a passage, but very dangerous, on account of the *sunken rocks* within it.

QUENDAL BAY.—The entrance to this bay is to the northward of Cross Island, by which it is somewhat sheltered. Steer in mid-channel, and you will find good anchorage at the west side of the bay, in 6, 7, and 8 fathoms water. Here you will ride safe, and secure from all but S.S.W., S.W., and W.S.W. winds. To the northward is Fitfill Head, a lofty promontory, 929 feet high, about $4\frac{1}{2}$ miles distant from Sumbro' Head. Fitfill Head is steep, and without any hidden danger. Having rounded this, you will see Colsay Island, lying directly opposite to an inlet, where there is deep water and good anchorage. Beyond it is St. Ninian's Island. Between its northern end and the main, vessels may find occasional shelter, riding in from 5 to 8 fathoms; but in the middle of the entrance is a *patch*, with only $3\frac{1}{4}$ fathoms on it, having a good channel on either side of it.

CLIFF SOUND.—To the northward of St. Ninian's, and between it and the Halvera Islands, is a passage into Cliff Sound. Its entrance is nearly a mile wide, with 25 fathoms mid-channel, free from rocks or dangers, except some sunken ones close to Maywick Holm. These you will leave to your starboard. On your port or larboard side is the long narrow island, called East Burra. Beyond this is the lesser island of Trondra. West Burra Island lies to the westward of East Burra, and runs nearly in a parallel direction to it. A small island lies off its western side, which is joined to

Burra by a *reef of rocks*. There is no passage between them. To the northward are Oxna, Papa, and Channes Islands, the former having numerous *rocks* about it. To the eastward of these are *three rocks*, above water; and two small islands, called Greenholm and Merryholm. Longa and Hildasay are to the northward; and several barren *rocks*, called *Sandistura Holms*, are to the northward of Hildasay, extending N.N.E. $\frac{1}{2}$ E. and S.S.W. $\frac{1}{2}$ W., nearly $1\frac{1}{2}$ mile. Bragin, another barren islet, lies between Hildasay and Skelda Ness. These islands and rocks have deep water all round them; and there are passages between most of them to the different voes, or inlets, situated at this part of the main land. Through Cliff Sound small vessels commonly pass to Scalloway; but there is a bar between Trondra and the main, which can only be crossed at high water, it then having 2 fathoms over it. Scalloway is a village, next in consequence to Lerwick, and, though small, has an ancient castle, in latitude $60^{\circ} 8' 31''$ north, and longitude $1^{\circ} 16' 25''$ west.

The best passage to Scalloway is between the islands of Burra and Oxna, Greenholm, and Merryholm, and is called the south channel. The middle passage is to the northward of Oxna and Channes, and to the southward of Hildasay and Longa. The northern passage is to the northward of Hildasay and Longa, and between them and Bragin, and the rocks of Sandistura. In each of these there is a good depth of water. The course and distance from off Fitfill Head to the entrance of Scalloway, by the south channel, are N.E. by N., 12 miles: then bringing the castle E. $\frac{1}{2}$ N., it will appear just open to the southward of Green Island, which is high and round. This mark will lead between Green Island and the small island called Merryholm, leaving the latter on the starboard side. In passing between these islands, keep nearer to Greenholm. Run in boldly, and anchor before the town, in 4 or 5 fathoms. It is high water, full and change, at Scalloway, at 9h. 30m.; springs rise $5\frac{1}{2}$ feet, neaps $3\frac{1}{2}$.

Skelda Ness lies from Fitfill Head N. by E. $\frac{1}{2}$ E., $14\frac{1}{2}$ miles. It is bold-to and rocky. N.N.W., $1\frac{1}{2}$ mile from Skelda Ness, is Gilderumple, a point of land, surrounded with several *rocks*, both above and under water. In the same direction, $2\frac{1}{2}$ miles farther, is Vaila Island.

VAILA SOUND is situated behind Vaila Island, having a channel into it on either side. The passage on the southern side is called the East Sound, and leads to Gruting Voe, a place of excellent anchorage. That on the northern side of the island is called the West Sound, and leads into Vaila Island Sound. The Eastern Sound is clear, and free from danger; but a *sunken rock* lies in the midway of the West Sound, which should be avoided; although there is water enough for a small ship to pass over it with safety. Several *rocks* also lie near the north end of Vaila Island, chiefly above water: but there is a *blind rock* near one of the islands, which, by steering near the main, you will readily go clear of. This place is considered one of the best anchorages on the western side of the Shetlands.

From Vaila Island the coast runs nearly N.N.W., 3 miles, to Watts Ness; and thence N.N.E., $3\frac{1}{2}$ miles, to Sand Ness. Sand Ness is the westernmost point of the main land, and forms the starboard point of entrance of Papa Sound. Papa Stour Island is the port or larboard boundary of the Sound, which is full of *dangerous rocks*, and never to be attempted without a pilot. Should you be obliged to enter the Sound without one, keep in mid-channel, in 9 and 10 fathoms. The course through is E. by S. and W. by N. The *Midsound Bass*, with 9 feet on it, lies on the south side of the Sound, about half-way through. N.W. by N. from Papa Stour, distant about 3 miles, are the *Ye Sherries*, two *rocks* above water, surrounded by others under water. They should not be approached too near.

ST. MAGNUS BAY is that extensive space between Papa Stour and Esha Ness. In it are numerous voes, or inlets, with good anchorages, particularly at Unzie, or Oni Frith, which lies to the south-westward Vementry Island; also at the voes behind Muckle Roe Island; and at Hillswick and Sandwick to the northward: but the best place to run into, with south-westerly gales, is Hillswick, or Hamer's Voe, in the N.E. part of the bay. The best anchorage in Hillswick Frith, for a large ship, is with Magnus Kirk bearing N.W., in 6 fathoms. Smaller vessels may run up towards the head of the bay, into what water they choose, by keeping mid-channel. The south extreme of Hillswick Ness is in latitude $60^{\circ} 27' 10''$ north, and longitude $1^{\circ} 30' 14''$ west. It is high water, full and change, at 9h. 45m.; spring-tides rise $6\frac{1}{2}$ feet, neaps $3\frac{1}{2}$.

ESHA NESS is a rocky point of land, which bends out to the south-westward, and

has a rocky island near it, called *Sarla Holm*. From hence the coast runs north-easterly, 2 miles, to *Hamna Voe*, a little inlet, fit only for small craft. N. by E., about $2\frac{1}{2}$ miles from the entrance of *Hamna Voe*, is the *Ossa Skerry*, a remarkable lofty rock, above water, with several rocks near it, and serving as a beacon for this part of the coast. From *Hamna Voe*, the coast runs nearly N.E., 2 miles, to *Ockren Head*; and then turns easterly, towards *Ronas*, or *Rooeness Voe*. This is a large inlet, opening south-easterly, and extending inward full $4\frac{1}{2}$ miles. There is good depth of water and anchorage within it. When 3 miles within the entrance, this voe turns suddenly to the eastward for nearly $1\frac{1}{2}$ mile, having from 19 to 12 fathoms water, until you are near the head of the Voe: here you will be land-locked, and sheltered from all winds. A little inland, to the northward, is a remarkable hill, called *Ronas Hill*, or the *Blue Berg*. It is, at its summit, 1476 feet above the level of the sea, serving as a land-mark for mariners. On its summit is what is called a watch-house, constructed of four enormous stones, and covered with two others, upon which a small pyramid, of lesser stones, is formed. Not far distant is a remarkable rock, rising perpendicularly on all sides, and appearing like a vessel under sail; and near it are two very high and inaccessible pillars, on which the cormorants breed.

The shores, all the way from *Esha Ness* to *Fethaland Point*, are steep and rocky. Between *Ronas Voe* and *Fethaland Point*, a rocky islet lies a little way from the land, called *Uya Baas*, having a shoal, of $4\frac{1}{2}$ fathoms, near its N.E. side; and there is a passage between it and the main. At 2 miles beyond *Uya Islet*, is *Sand Voe*, another inlet, with convenient anchorage for small vessels.

Fethaland Point is the northern extremity of the main land of Shetland, and is distant from the entrance to *Rooeness Voe* about 8 miles. Off it lies *Greenholm*: and farther to the northward are two large rocks, above water, called *Romna Stacks*. Between these and *Yell Island*, to the eastward, is the northern entrance to the Sound of *Yell*.

Whalfrith Voe, on the isle of *Yell*, has anchorage within it; but its starboard point of entrance, named *Graveland Ness*, is rocky a considerable way out. It should be remarked, that it will be difficult to sail out of this place with a westerly swell; and consequently it is inconvenient, and not recommended. *Gloop Voe* is on the northern side of the island, and open to the north winds: there is, nevertheless, anchorage, with from 5 to 2 fathoms, clean ground; but it is little frequented.

Between *Yell Island* and *Unst*, is *Blumel*, or *Blue Mull Sound*. The shores on both sides are rocky; and vessels, if occasion requires, may with care pass through it with safety; but there is always a strong current.

Burra Fiord is an inlet, on the north part of *Unst*, with some rocky islets before it, called the *Burra Fiord Holms*. There is anchorage within it; but it being so open to the northward, is little frequented. Off the north-eastern part of *Unst* is a rocky islet, called the *Scaw*.

FULO, or FOUL ISLAND (more properly *Fowl Island*, from the numerous birds which resort there), is the westernmost of the Shetland Islands, the summit lying (according to Mr. Thomas) in latitude $60^{\circ} 8' 18''$ north, and longitude $2^{\circ} 5' 40''$ west. Its S.E. point lies N.N.W. $\frac{1}{2}$ W., about $23\frac{1}{2}$ miles from *Fitfill Head*. W.N.W., 18 miles from *Skelda Ness*; and nearly S.W. by W. $\frac{1}{4}$ W., 25 miles from *Esha Ness*. It runs in a N. by E. and S. by W. direction; is $2\frac{1}{2}$ miles long, and $1\frac{1}{2}$ mile broad, being foul all round; but more particularly at its northern part, where a reef of rocks runs off a full mile, called the *Friar's Rocks*. There is but one place of landing, which is at *Ham*, on its eastern side; and this place is much resorted to by fishermen. This island is 1369 feet high, and may be seen from the Shetland Islands; and also, in clear weather, from the Orkneys; the cliffs on its western side being elevated 1000 feet above the sea, while its eastern part slopes down in some places quite level with the edge of the water.

HAVRE-DE-GRIND.—To the south-eastward of *Foul Island*, distant 2 miles, lies the *Havre-de-Grind Rocks*, which occupy a considerable space, and have on their shoalest part only 2 feet over them, at low water, spring-tides. These rocks bear from *Fitfill Head* N.N.W., distant 22 miles; from *Skelda Ness* W. by N. $\frac{3}{4}$ N., 16 miles; and from *Foul Island* south point E.S.E., 2 miles. Between them and *Foul Island*, are soundings, of 20 and 25 fathoms; around them, 5 and 6 fathoms; and between them and the main land, from 25 to 46 fathoms.

SAILING DIRECTIONS FOR THE SHETLAND ISLANDS.

BRASSA, or BRESSA SOUND.—To sail into Brassa Sound from the southward, you should endeavour to go in mid-channel, running in without fear, for the shores are bold-to. Bring the two points of land which are to the southward of Kirkoby Ness on with each other, and you will pass the reef that runs from Kirkoby Ness, and to the eastward of that which stretches from the Nab; or keep in mid-channel, until you perceive the Castle of Lerwick; when, being in 8 fathoms, haul up to the westward, and anchor before the town, in 8, 9, or 10 fathoms; or run on farther northward, taking care to avoid the *Loofabar Rock*, which lies in mid-channel, with only 3 feet water over it; and anchor between it and the shore, in 6, 7, or 8 fathoms, on good holding ground. This harbour is capacious, and capable of containing a fleet, well sheltered from all winds. Large rings are fixed in the rocks for your cables to be fastened to; so that you will have no occasion to moor with 2 cables, as heretofore.

To sail out through the North Sound, keep near the main land, which is bold, until you have passed the *Loofabar*; then give a good berth to Hogan Point, because a *sandy spit* stretches out from it. There is also a *middle ground*, of 9 feet water, hereabout, with a channel on each side of it, that on the western side having the deepest water; keep therefore about $\frac{1}{2}$ of the width of the passage from the main, and pass through the Narrows, where you will not have less than $2\frac{1}{2}$ fathoms water: and after you have passed the Narrows, steer out E. by N. or E.N.E., between the island of Beoster and Greenholm, leaving the *sunken rocks*, which lie off the latter, on your port or larboard hand; but as this passage has not sufficient depth of water for any ship drawing more than 16 feet, it will not be prudent for strangers to attempt going through without a pilot.

Between Brassa and the Mull of Eswick, is the inlet of four harbours, or voes—Deal's Voe, Laxfrith Voe, Wadbister's Voe, and Catfrith's Voe. They are all clean, and have good anchorage. Deal's Voe runs in W.S.W., about 2 miles, and has good anchorage, in from 10 to 5 fathoms, being the southernmost of the four voes; and its approaches from the sea are rendered difficult, in consequence of several *sunken rocks*, which lie at a distance from the land. *Unicorn Reef*, with only 6 feet water on it, lies south, $\frac{1}{2}$ a mile from Glitness Island; and E.S.E., $\frac{3}{4}$ of a mile from Hawk's Ness. The best passage in, is between Unicorn Reef and Greenholm Island. You will have the voe open when Glitness bears N.W. by W., 1 or $1\frac{1}{2}$ mile. You may then steer W.S.W. directly for it, leaving the Unicorn Reef and Hawk's Ness Baas on your starboard; and the Greenholm, Nive Baas, and Brethren Rocks, on your port or larboard hand. The channel is nearly a mile wide. When coming from the eastward for Catfrith, Wadbister's, or Laxfrith Voe, bring the south point of Glitness Island to bear from N.W. to W.N.W., when you may steer for it, passing near its south end, to avoid the Unicorn Reef. You will now have Laxfrith Voe open, and may run in S.W. by W., and anchor, in 6 or 7 fathoms; or continue on to the north-westward, $\frac{3}{4}$ of a mile past Railborough Ness. You will now open Wadbister and Catfrith Voes, the former running in west, about a mile, and the latter N.N.E., the same distance. This is an excellent harbour, and capable of containing 100 sail. In the middle of the entrance to Wadbister's Voe is a *patch*, of 9 feet, with a channel, of 6 to 9 fathoms, on either side: by keeping towards either shore, you will avoid it.

Vessels coming in for these voes from the northward, and having passed the Outer Skerries to the eastward, should haul in W. by S. $\frac{1}{2}$ S. for Rumble Holm; and passing a mile to the southward of it, a W. $\frac{1}{2}$ S. course, 7 miles, will bring you to the *How Stack*, a high round rock. Take care you do not bring the Stack on a west bearing when approaching it, for the *Snacka Rock* bears east from it, $\frac{3}{4}$ of a mile; and when Glitness Island bears W.N.W., steer towards it, as before directed. When coming from the southward, bring Noss Head S. $\frac{1}{2}$ W., and How Stack N. $\frac{1}{2}$ E.; run with these marks, until Glitness bears N.W.: you may then steer towards it as before.

SOUND OF YELL.—To go through the Sound of Yell, from the southward, you should pass to the eastward of Whalsey Island; for the passage between it and the main is encumbered with *rocks* and islands, and considered difficult and dangerous.

A N.N.W. or N.N.W. $\frac{1}{4}$ W. course, will take you clearly through between Whalsey Island and the Out Skerries; and when abreast of Luna Holm, the Sound will be open, and you may take any channel between the islands that may be most convenient. The water is very deep, and 30 or 40 fathoms will be found very near some of the islands in the Sound. To sail between Yell and Unst Islands, from the southward, you may pass between Hascosea and Fetlar, through Colgrave Sound, or between Fetlar and Unst. The direct course through the former is N.N.E., which will carry you to the island Longa. You may leave this island either to the eastward or westward; and having done so, a N.N.E. $\frac{1}{4}$ E. course, nearly, will take you through the Sound of Blue Mull. Here the current is very strong. A good attention to the tides, and great care, is requisite to guard against its effects. To go to the northward of Fetlar, you must pass between Haaf Gruna and Gruna Islands. A W.N.W. $\frac{1}{4}$ northerly course, will take you clear of these islands, southward of Wedderholm. You will have 3 or 4 fathoms a cable's length off: and take especial care you are not driven by the tide too near the islands at the N.W. end of Fetlar; for the ground, all about Longa, Gruna, and Dau, is *foul and rocky*.

BALTA SOUND, although not so large, is in some respects equal to Brassa, and has in the shoalest part from 6 to 8 fathoms. The southern entrance between Hunie and Balta Islands is easy, and clear of any danger, having from 12 to 16 fathoms in it. Captain Ramage, who surveyed this harbour, states, that "a stranger having the chart, may boldly run in, only keeping Hunie Island on the port or larboard, and Balta on the starboard. Should a southerly gale raise much sea between the islands, set lofty canvass, seaman-like, keep the jib up, and steer directly between the islands. Here a pilot will come on board; but should that not be the case, shorten sail, and, according to the wind, run to the first place of anchorage marked on the chart, keeping the eastern part of Fetlar Island open of the south end of the Balta." In making the Harbour of Balta, or the Bay of Uya, on the south side of Unst, the tide should be particularly attended to, more especially if you intend attempting the northern passage. In shifting from Uya to Balta, it will be necessary to make use of the latter part of the flood and the first of the ebb; since, without the first of these, it will be difficult to beat out of the Bay of Uya; and, without the last, equally inconvenient to beat into that of Balta.

If desirous of going from Balta Sound, or Uya Bay, to Cloup Voe, or the western parts of Yell Island, it is requisite to understand, that the passage round the Scaw, in the former case, or that of Blue Mull Sound, in the latter, are inexpedient, and even, on certain occasions, dangerous; so that it will be more advisable to take the southern passage through Yell Sound. The strength of the current through Colgrave Sound, within Fetlar, though far less than the stream which runs with such velocity through Blue Mull Sound, renders it also necessary to be well acquainted with the times of the ebb and flow through that passage, no less in merely sailing through it, than in attempting to make the harbour of Basta Voe.

In passing round the Scaw and Lamba Ness, a knowledge of the tides is absolutely necessary, for their strength is very great; and it is requisite to take advantage of both ebb and flood, on rounding these headlands. The whole of the flood or ebb is equally required to make your passage from Fethaland to Hillswick, or from Papa Stour to the southern harbours of Aethsting. The same observation applies to all the harbours on the western shores of Shetland; and a miscalculation of the time or velocity of the current, especially with scant wind and a-head, may be productive of serious danger and inconveniences. The shores on the east side of the Shetlands are very steep; you will generally have from 40 to 50 fathoms within a league of the coast, and 5 or 6 miles off, there will be 120 and 130 fathoms.

QUENDAL BAY.—To the N.W. of Sumbro' Head lies Fitfill Head. Between these is Quendal Bay. The course in is N.E.; and you may get anchorage on the western side of the bay, in 6, 7, or 8 fathoms, where you will be sheltered from all winds, except those from the west to S.W. The passage between Cross Island and the eastern shore is foul and dangerous.

SCALLOWAY.—The entrances to Scalloway are four;—through Cliff Sound, between East Burra and Tronsa Islands, and the main land; through the South Channel, or between West Burra and Merryholm, on the one side, and Oxna, Papa, and Green Island on the other. In the Middle Channel, or between Channes and

[NORTH SEA.]

Papa, to the southward, and Hildasay and Longa Islands, to the northward; or the North Channel, between Hildasay and Sandistura, and to the northward of Longa.

To sail through Cliff Sound to Scalloway, you will leave Halvera Islands on your port or larboard side, and St. Ninian's Islands and Maywick Holm on your starboard side, steering in E.N.E., and keeping nearer to East Burra Island, until you bring Tingwall Kirk to bear about N.E., touching the east side of Trondra Island; run on with this mark as far as the south end of Trondra Island, then haul over to the eastern shore: and at the north end of Trondra, a *sandy bar* runs across, which, at high water, has 2 fathoms over it; you will, therefore, wait the proper time to go over it, and turning round the north end of Trondra, anchor abreast of Scalloway Castle in 4, 5, or 6 fathoms. This is a safe and secure harbour, well sheltered from all winds, and the ground clean and sandy.

To sail through the South Channel, which is considered to be the best and safest, bring Scalloway Castle to bear E. $\frac{1}{2}$ N.; it will then appear open to the southward of a high round island, called Greenholm, and will carry you between it and Merryholm, which is a small island, to be left on your starboard side. In sailing up this channel, you will have from 20 to 5 fathoms. Between Green Island and Merryholm there are only $3\frac{1}{2}$ fathoms near the latter; therefore, keep nearer to Green Island: and 7, 6, and 5 fathoms, as you advance toward the anchorage before Scalloway.

To sail through the Middle Channel, bring Scalloway Castle to bear E.S.E. $\frac{1}{2}$ S., and pass near to the north end of Channes Island; and then steer S.E., $\frac{3}{4}$ of a mile, towards Greenholm Island, in order to pass to the southward of a *patch of foul ground*, with only 5 feet on it, which lies in mid-channel. As soon as the south end of Longa Island bears E. by S., distant $\frac{1}{2}$ a mile, steer more towards it, giving the end of the island a berth of a good cable's length in passing; then edge over to the northward a little, and pass between the three rocks and Greenholm on one side, and the main land on the other; round the western point of the main land, and steer up channel for the anchorage.

To sail through the Northern Channel, bring Hildasay Island to bear about east; but be careful not to advance too near the island, on account of the *ledge of rocks*, which runs off its S.W. end. Having completely cleared the north end of Hildasay, turn round to the east and south-eastward, going to the eastward of Longa, and between the three rocks and the main, as before described.

VAILA SOUND.—To sail into Vaila East Sound, which is the best and widest channel, if the wind be from the W.S.W. or S., steer for the S.E. end of Vaila Island, which is high and bold-to. There is an old Pict's castle built on the high land opposite, which forms a very remarkable object to know the entrance by. On the starboard side is Flass Island, a bold barren *rock*, which you will pass to the westward of, and steer N.N.W. toward Vaila Sound; this will carry you mid-channel, in from 15 to 4 fathoms water, which is in the narrowest part of the channel. Here you will see the Island of Longa dividing the Sound into two parts. The channel between Longa and the main, or White Ness, is the narrowest; at its entrance is a *rock*, above water, lying nearly in the middle of the channel. At the farther end of the creek stands a kirk, and near it the minister's house; bring this kirk to bear N.N.E., and it will carry you up the inlet, and to the eastward of the rock: let the same kirk bear N.E. by N., and you will pass to the westward of the rock. There are 9 fathoms at the entrance, 8 and 6 as you advance up it, and thence shallowing toward the end to 2 fathoms.

To sail in by the West Sound, you must take particular care of a *rock*, which is situated directly in the middle of the entrance; the passage in is not above $\frac{1}{2}$ of a mile wide; an E. by N. course will take you to the southward of the rock; an east course will carry you to the northward of the rock: this latter is the better passage of the two. There is water enough for a small ship to pass over this rock, though the sea breaks over it; all around it is deep water. Having passed on either side of this rock, edge over to the main, to avoid a *blind rock*, which lies opposite to a building on Vaila Island, standing near the water's edge; it is nearer the south shore, not far from Limekiln Rock, and should be left on your starboard side. When you have passed the three islands on your port or larboard side, you will open Vaila Sound, and may haul over to the northward, and anchor. The rocks which lie off the north end of Vaila Island, render this passage not so safe as the eastern one.

GRUTING VOE.—If you intend going into this place, you will proceed, as before directed, for the East Sound, steering boldly in between Flass and Vaila Islands; but instead of turning towards Vaila Sound, steer for Green Head, for the opening or entrance to Gruting Voe cannot be seen till you are near the peninsula of Green Head. Haul boldly round the head; for though the channel in is but narrow, the water is deep, having 18 and 20 fathoms mid-channel. When past the narrow strait, it becomes wider, the course up it being about N.E., easterly. Here is excellent anchorage, with from 14 to 3 fathoms, gradually shallowing as you advance; at the farther end of the Voe is Gruting Holm. To the starboard are two narrow voes, called Olas Voe and Selie Voe, fit only for small vessels. Bruland Voe terminates this inlet, and has anchorage, in 3 and 4 fathoms water. Vessels within these voes are at all times perfectly safe, and may anchor wherever they please, being completely land-locked. It should here be observed, that no vessel ought to attempt beating out of the East Sound with a swell from the S.W., for such will inevitably prove hazardous, on account of the narrowness of the channel, and the height of the surrounding land, which frequently produces sudden and baffling squalls. There is no room to tack in the passage, and no ground to hold your anchor, should the vessel miss stays.

ST. MAGNUS BAY.—This comprehends that large space between Sands Ness and Esha Ness. Off the former lies Papa Stour, a large rocky island, steep to in every part. Several small voes, of 7 and 8 feet water, are on the eastern side of the island; and one called Hamna Voe, on its southern part; there is an anchorage within the latter, in 8 feet water. Between Papa Stour and the main is a passage into St. Magnus Bay, but not to be attempted without a pilot. On the S.W. side of Papa Stour is a natural cave, with three entrances, through which the tide ebbs and flows; this cave has several apartments, and is wide enough to admit a large boat, with plenty of room for the oars. In the centre it becomes wider, and is ornamented with a handsome arch; beyond which, you will be enlightened from an aperture at the top. On the north side of the bay is a curious islet, called Dureholm, perforated by a vast arch, 70 feet high. Here boats frequently arrive to fish, having light from an opening at the top. Vessels in stormy weather, when making for St. Magnus Bay, should be careful to avoid the Ve Skerries; and, if embayed with westerly winds, and unable to regain the sea, it will be prudent to run into Swarbrick's Min; but if the wind should be to the southward of west, a vessel, in attempting to weather Muckle Roe, may fail in this object, and become so deeply embayed, as to run on shore on Egilsha, the Long Head, or Isleburg Ness. In this case, it will be better to make for Hillswick, or Hammer's Voe, as more to leeward, and where the entrance is not difficult. If once you get to leeward of the Long Head, it will be too late, with such a sea as the westerly swell sets in during a gale of wind, to attempt Hillswick, and equally impossible to weather Muckle Roe. The passage between Muckle Roe Island and Vementry, leads to several voes or inlets, where there is anchorage and shelter from all winds, in from 8 to 20 fathoms water. Some vessels have sailed through Rooe Sound, which is to the northward of Muckle Roe Island. A round rock, above water, lies midway at its entrance, having a channel on either side of it. This passage is now too shallow, and will scarcely afford sufficient water for large boats. In Houas Voe, Papa Stour, ships of moderate burden may find occasional anchorage, or wait for the tide to the southward; or they may anchor almost any where to the westward of Muckle Roe.

There is good riding in Oni Frith, the entrance being between Vementry Island and Neing Head; but care must be taken to give a berth to the latter, for several rocks, under water, lie off the point. When you have passed these rocks, you will have from 24 to 9 fathoms water, shoaling as you advance; the anchorage is good, and well sheltered. About a mile to the southward of Esha Ness, the N.W. point of Magnus Bay, is the *Ossa*, or *Esha Ness Sherry*, a prodigious and remarkable rock, serving, like a beacon, to point out this part of the coast.

GREAT FISHING BANK.—An extensive bank, abounding with cod, haddock, and other fish, lies to the westward of the Shetland Islands. It is described as lying from 25 to 30 miles west from Foul Island; beginning to the westward of Westra Island in the Orkneys, and extending, in a north and north-westerly direction, as far as 20 miles to the north-westward of Shetland Islands; its breadth is supposed to vary from 18 to 20 miles, and its length to be full 120 leagues. Recent information assigns to it a depth of from 40 to 50 fathoms. Abundance of fish are now annually caught on this bank, rendering it an object of great importance, as well as national advantage.

In all probability, this is part of a bank of soundings, upon which the Orkney and Shetland Islands are based; and, when thoroughly explored, will prove highly beneficial to mariners navigating these parts, enabling them to make a certain landfall.

TIDES IN THE ORKNEYS, SHETLANDS, &c.

THE tide flows, on the change and full days of the moon, as follows:—Duncansby Head, at 10 o'clock; and the east shore of Swona, at 9½ o'clock; on the west shore, at 10 o'clock; west shore of South Ronaldsha, at 10 o'clock; Stromness Harbour, Walls, and Westra, at 10 o'clock; Fair Island, at 11h. 15m.; Foul Island, at 9½ o'clock; on the east side of Shetlands, at 9½ o'clock; Brassa Sound, at 10 o'clock; in Lerwick Harbour, at 10½ o'clock; on the east side of Stronsa, at 10 o'clock; in Stronsa Frith, at 11 o'clock; on the east sides of Sanda and North Ronaldsha, at 9½ o'clock; in North Ronaldsha Frith, at 10½ o'clock.

The stream of flood on this, as on other parts of the Orkneys, comes from the N.W., and runs east between Sanda and North Ronaldsha; south along the west side of Sanda, and between the Red Head of Eda and the Calf of Eda, and continues its progress through Stronsa Frith, until it loses itself in the open sea. That part of the flood which sets on North Ronaldsha, divides, opposite to the kirk, about ¼ of a mile from the shore; one branch of it runs northward to the Selch Skerry, and thence eastward to the sea; the other runs close along the south side of North Ronaldsha, over the Reef Dike Rocks, and thence to the north-eastward. The stream near the north side of Sanda, runs along Ire and Rive to Tafts Ness, from Tafts Ness to the Start, and from the Start to Tress Ness, beyond which it is scarcely perceptible. On the east side of the North Ronaldsha, the stream runs mostly to the northward. Along the east side of Stronsa, the flood runs south-east; along the west side, south; from Rousholm Head to Lamb Head, the stream, for the first 3 hours of flood, runs N.E., and from that time until it is low water, S.W. When the south-westward stream of flood has got to the south-west part of Rousholm Head, it there meets the stream of flood from Stronsa Frith, and is thence turned S.E. towards Copinsha Island.

The stream in Stronsa Frith runs about 4 miles an hour with spring-tides; and with neap-tides 1 or 1½. On the north and east sides of Stronsa, the stream is scarcely perceptible, except near to Burrow Head and Lamb Head, where it runs almost 3 miles an hour when strongest. On the south side of Stronsa, spring-tides run 2 miles an hour.

In North Ronaldsha Frith, spring-tides run about 5 miles in an hour; neap-tides 1½ mile. On the south side of Sanda the stream is scarcely perceptible, except from the Start to Tress Ness, where it runs about 3 miles an hour when strongest.

The flood at Fair Isle, as at the isles of Orkney, sets in from the N.W. It divides near to the shore on the N.W. part of the island; and running along the north and south ends of it, forms a large eddy on the east side. The stream, when strongest, runs about 6 miles in an hour; neap-tides do not run more than 2. Ordinary spring-tides rise 4 feet; extraordinary spring-tides rise 6; neap-tides seldom rise more than 2 feet. At Foul Isle, spring-tides rise 6 or 7 feet, neap-tides 4 or 5 feet. On the east side of the Shetland Islands, spring-tides rise 6 or 7 feet, neaps 3 or 4; in Brassa Sound, spring-tides rise 6 feet, neaps only 4; and the stream runs slowly into the harbour of Lerwick.

In the Pentland Frith and Orkney Isles the water flows about 8 feet with an ordinary spring-tide, and about 3½ upon a neap; though, sometimes, by the wind's blowing hard from the west or S.W., spring-tides will rise 14 feet, and neaps 6 or 6½. N.E., east, and S.E. winds, which cause lower tides, may sometimes occasion the springs not to rise above 6 feet, and the neap-tides 2 feet.

IN THE PENTLAND FRITH, the tides run with greater rapidity and diversity of motion than, perhaps, in any other part of the British seas. The obstructions which the direct course of the tide meets with, from the islands lying in the Pentland Frith, diverts its direction into eddies, races, counter-tides, and sometimes into whirlpools, amazing and terrifying to such as are inexperienced in tide-ways; but to those acquainted, these irregularities become serviceable: sometimes by keeping off the violence of the stream, and affording stagnant water, in which a vessel may tack, or anchor, till the

return of a favourable tide ; at other times, by carrying her against the tide, or more to windward, and thereby facilitating the passage to either side of the Frith ; which will more plainly appear from the following description :—

The body of the flood in Pentland Frith comes from the N.W., and its motion is perceived sooner near the land, on either side, by 3 hours, than in the middle of the Frith, being gradually propelled from the shores, outward, as the tide makes. About $\frac{1}{2}$ of a mile from the middle of each island, in its way, it divides into two branches, one of which runs towards the north, and the other towards the south end of it ; whence along with the stream that runs directly with the extremity of the island, they proceed eastward, about a mile or more, and there join, enclosing an eddy, within which there is a slow stream westward towards the island. There is one of these eddies on the east side of the Swona, which extends about $1\frac{1}{2}$ mile from it ; one on the east side of Stroma, which extends about a mile from that island ; and one on the east side of Pentland Skerries, which is not bounded as the other two, but opens wider as it recedes from these islands, until the streams lose themselves in the open sea. These eddies change their direction from the east towards the south, gradually, as the flood makes ; so that the stream, which at the beginning of the tide runs from Swona between South Ronaldsha and Pentland Skerries, at the latter end of the flood, turns towards Duncansby Head. The like eddies are formed with ebb-tide, on the west side of these islands, gradually varying their directions from the west towards the north ; only the eddy of Pentland Skerries is very small, not extending above $\frac{1}{2}$ of a mile from the Great Skerry ; but the others are as large, or larger, with ebb than with flood-tides. There are whirlpools observed near the south end of Swona, with flood ; and also near the north ends of Swona and Stroma, with ebb-tide : but never so large as to be dangerous to shipping.

Westward from the north end of Stroma, there is always a great swelling sea, and often breakers, during ebb, in the calmest weather, especially with spring-tide ; these are called the Swelky of Stroma, and ought to be avoided. The Men of Mey is a rough breaking sea, over a rocky reef, which makes westward from the south end of Stroma, with flood-tide.

From Duncansby Head, at 2 hours' flood, over towards Stroma, is a very strong tide, called the Bore of Duncansby, which, with an easterly wind and spring-tide, breaks very much. This is occasioned by a ledge of rocks in that direction, about 8 fathoms below the surface. This tide is often dangerous to boats when they cross the Frith, but is not so violent as the preceding.

The greatest velocity of spring-tide in Pentland Frith is 9 miles an hour ; neap-tides do not run 3.

ORKNEYS.—From some observations on the tides in Orkney, it appears that the water begins to rise and fall sooner near the shore, or near visible rocks, than at a distance from them. When spring-tide is at its greatest altitude or depression, the water continues in a quiescent state nearly $\frac{1}{2}$ an hour ; neap-tides continue so about $1\frac{1}{2}$ hour. The motion of the water, both in ascent, descent, and progression, is accelerated from the first to the fourth hour, commonly : from the fourth to the last hour of the tide its velocity diminishes. This, however, admits of some variation, from the influence of winds.

The greatest spring-tides and least neap-tides are commonly on the fourth day after the syzgies and quadratures ; but in this also, the winds have a considerable influence : west and south-west winds making the greatest floods and least ebbs. North and north-east winds, on the contrary, hinder the rise, and promote the falling, of the waters in the Orkneys and on the north coast of Scotland. When the flood-tide is raised higher than ordinary by winds, the next following ebb is not so low as it would otherwise have been. When a high flood is raised by the moon only, the succeeding ebb is proportionably low. Ordinary spring-tides rise about 8 feet perpendicular, ordinary neap-tides $3\frac{1}{2}$; extraordinary great spring-tides rise 14 feet, extraordinary small spring-tides only 5. Extraordinary great neap-tides rise above 6 feet, and extraordinary small neap-tides not above 2. Yet the rise and fall vary so much, that it would require a long course of observations to determine, with certainty, what is most common in these cases.

When a stream of tide is interrupted by land or rocks, or confined within a narrow channel, or long arm of the sea, growing uniformly narrower the water will rise higher

there than in the neighbouring places, where it is not so obstructed. If the channel, or long arm of the sea, has several windings, or reaches, as they are called in the Thames, the superior elevation will not be considerable.

REMARKS.

*The foregoing Particulars relate to the RISING and FALLING of the TIDES ;
the following to the various MOTIONS of the STREAM.*

TOWARDS the coasts of Orkney and Fair Isle, off Shetland, the flood comes from the north-west. A league or 2 off the coast, the strength of the stream is scarcely perceptible, unless it be confined by land, interrupted by rocks, or runs over shoals a few fathoms below the surface ; in which cases, its motion is also quicker than on an open uniform coast, where it meets with no interruption.

When the tide begins to rise or fall on the shore, the stream near the shore begins to turn, and reverse its direction, a few irregularities excepted.

The stream of tide changes its direction sooner near the land than at a distance from it ; inasmuch, that in a place 2 or 3 miles from the land, the turning of the stream is 2 hours, or more, later than on the adjacent shore. At the intermediate distances the stream turns at intermediate times. Hence, one vessel may find a favourable tide near the land, whilst another, at a greater distance, will have the stream against her, and *é contra*. This contrary direction of the stream is perceptible in the narrowest channels.

During the continuance of flood, the stream varies its direction gradually from the east towards the south ; and on the contrary, the stream of ebb varies from the west towards the north—that is, if the stream, when it becomes first perceptible, runs east, at the latter end of the tide it will run nearly south, if the proximity of land or shoals does not hinder or divert its course another way. It will be found of advantage, in a rapid tide-way, to attend to this gradual variation of the stream.

The greatest velocity of spring-tides in Orkney, in the channels where it runs quickest, is about 9 miles an hour. The celerity of neap-tide is about $\frac{1}{4}$ of spring-tide. A spring-tide acquires a considerable degree of strength in less than an hour after its quiescent state begins ; neap-tides are hardly perceptible in 2 hours after still-water. The stream is most rapid generally between the third and fourth hours of the tide.

If a sound or strait, between two islands, lies in the direction of the main body of the tide, the velocity of the stream in that strait will be greater (all other things alike) than in any other adjacent one not lying in the same direction.

In similar straits or channels, lying in the same direction, and supplied from the same part of the ocean, the velocity of the streams will be in proportion to the width of the inlets directly, and the outlets inversely.

If an island lies directly in the tide-way, the stream will divide or split, before it reaches the island, into two branches, one of which will run towards one end or side of the island, and the other towards the other end of it, and, in passing along, will be reflected a little by the land, so as not to touch it. The stronger the stream is, and the longer that side of the island towards which it runs, so much farther from it will the stream divide ; and the quicker the oblique stream runs along the sides or ends of the island, the stronger will be their reflection. Hence, a vessel in a calm, carried along by a rapid tide or current, will be in no danger of touching a single island or visible rock, if the water is deep enough near them.

If a small island lies athwart a rapid tide-way, that part of the stream which runs along one end of it, will join that which runs along the other, at some distance beyond the island, enclosing between them a curved space, within which there is either no perceptible current, or a slow one towards the island, contrary to the other streams. This stagnant space in the middle of a rapid tide, is called an eddy. If the island that occasions an eddy is large, or has other islands or rocks near it, so situated as to deflect the streams considerably out of their direct course, they will not then join, as in the

former case, but go off in a parabolic form, widening from the island, and their strength gradually diminishing, till they are lost insensibly in the open sea. Examples of both these eddies have been already described.

Some of them are a mile or two in length, and convenient to beat about in, till the tide is spent. In some there is clean ground, where, if there is not wind enough, or sufficient room for tacking, a vessel may stop at anchor, till the return of a favourable tide. These eddies may not only be of great service to ships or boats, by sheltering them from a strong stream, but also by carrying them against it; and thereby enabling them to cross it with more advantage, according to the different places to which they are bound. The extent and direction of an eddy are always distinguishable by the eye, when the tide is strong; for the opposition of the bounding streams make the waves there higher and rougher, in blowing weather, or with spring-tide, and of a darker colour in calms, with neap-tides, than in other places. The most boisterous parts are near the two extremities of the island, and a little beyond the vortex, or top, of the eddy, where the streams that form it unite.

The collision of these opposite and oblique streams near the island, will excite a circular motion in the water; and, if the celerity of the tide is great, will occasion whirlpools in form of an inverted bell, wide and rounded at the mouth, and narrower towards the bottom. Those, with spring-tide, in Pentland Frith, near the islands Stroms and Swona, may turn any vessel quite round; but are never so large as to endanger her otherwise. There are instances, however, of small boats, which, by the inadvertency of the rowers, have dropped into them, and were swallowed up. The cavity is largest when it is first formed, and is carried along with the stream, diminishing gradually in dimensions as it goes, until it quite disappears. Before the extinction of one, two, or sometimes three, more will appear, following each other like so many pits in the sea, moving along with the tide. The suction or spiral motion communicated to the water does not seem to extend far beyond the cavity; for, happening in a boat to pass within 20 yards of one of these whirlpools, or wells, as they are called in Orkney, Mr. Mackenzie was not sensible of any attraction towards it; but, indeed, it was towards the latter end of the tide, when its strength was considerably abated. The diameter of the mouth of the cavity, at that time, he judged to be between 2 and 3 feet. Fishermen affirm, that if they are aware of their approach towards a whirlpool, and have time to throw an oar, or any other bulky body into it, they will get over safe; the reason is, when the continuity of the surface is broken, and the vertiginous motion of the sea interrupted, by any body thrown into it, the water must rush suddenly in on all sides, and fill up the cavity. For the same reason, in blowing weather, or when the waves break, though there may be a whirling round, there can be no cavity.

When there is a steep sunken rock near the concourse of such rapid tides, and not very deep below the surface, a most amazing phenomenon will happen; for the stream, being interrupted in its course, and falling suddenly over the rock, is forcibly reflected from the bottom upwards, carrying sand, shells, fishes, or other loose bodies along with it; which, with boats, or whatever else is near, are driven with great violence from the centre of the eruption, all round towards its circumference; then the surface all over continues to swell and bubble for some time, like boiling water, until a regular gyration ensues, and a whirlpool begins, which is carried along with the stream, as was said in the preceding paragraph, and lessens by degrees till it is quite extinguished. Soon after, a new eruption, followed by an ebullition and whirlpool, commences, and then another, until the celerity of the stream abates, or the tide rises or falls too much above or below the rock.

If the tide runs quicker, or more obliquely, by one end of an island than by the other, a languid current will continue running from one of those streams towards the other; that is, the tide along one side of that island will set longer in one direction than in the contrary.

If a strong stream of tide runs across the mouth of a bay that does not reach far into the land, within that bay there will be a slow stream setting contrary to the other. By attending to this, one vessel may keep her course or gain a port, while another is carried away by the tide.

During the last hour or last half-hour of strong spring-tides, the stream in the middle of a channel or sound, and sometimes a mile or two off an open coast, appears rough and breaks, as if running over a shoal, or confined within a very narrow channel; while

the sea on each side may be quite smooth. This, strangers have often mistaken for shallow water, and to avoid it, have needlessly gone out of their course, or dropped anchor in an improper place.

There are several tide-ways among the Orkney Islands, where, during ebb-tide only, the surges swell to an extraordinary height, and rage and break with great violence, even in the calmest weather; insomuch, that sometimes no open vessel can go over them; but during flood, the water there is as smooth as in any other part. Such places are called, in Orkney, rosts, which the inhabitants are very careful to avoid while ebb-tide continues, but not in the least afraid of them with flood. A rost rages most with a spring-tide and west wind. The most dangerous of these are Dennis Rost, on the north side of North Ronaldsha; Lashy Rost, between the Calf of Eda and Sanda; Rull, near Wart Holm, on the south side of Westra; and Swelky, the west side of Stroma, in the Pentland Frith.

THE COASTS OF FRANCE, FLANDERS, HOLLAND, AND JUTLAND, FROM CALAIS TO THE SCAW.

FROM CALAIS TO THE TEXEL.

Description of the Land, &c.

GENERAL REMARKS.—The appearance of the land from Calais, eastward, is low and flat, skirted all along with small sand-hills, and rising, with a gentle and gradual acclivity, inland. The churches and large buildings form distinct and conspicuous objects, and may be seen by the mariner at a considerable distance. Holland is of a similar description, and somewhat still lower, being broken, in various parts, by the openings of the rivers Scheld, Maas, &c. The shores are all the way lined with numerous and extensive *shoals* and *sand-banks*, many of which run parallel to the land, and have various passages between them, which are frequently shifting, and are both intricate and dangerous.

From CAPE GRISNEZ and CALAIS to OSTEND.—Cape Grisnez is of a white cliffy appearance, and has a battery upon it. The coast runs from it toward Blancnez, called also Calais Cliff, nearly E. by N., distant 2 leagues. Between Blancnez and Grisnez the land is hilly, though the shore about Wissant, which is midway between, is sandy. A *dry sand*, at low water, extends the whole way along shore, from Calais to Cape Grisnez, drying upon an average $\frac{1}{2}$ of a mile from the shore. Upon this sand, to the N.E. and S.W. of Blancnez, are some *rocks*. The water continues shoal to some distance from the dry sand, and on the parallel of the Bas Escalles, stretches out 2 miles from the coast, turning S.W. to Cape Grisnez, forming the *Ligne Bank*, some parts of which, in an E. by N. direction from Cape Grisnez, dries; but, to the south of which, there is a very shallow channel. The *Ronge Riden* and the *Quenois* lie to the north and N. by W. from Blancnez, the least water upon each being a fathom; the outer one, the Quenois, is about $1\frac{1}{2}$ mile from Blancnez. Upon the N.W. part of the Ligne Bank, and called the Barrier, the depth is not more than $4\frac{1}{2}$ feet; and, to the eastward of which, near to the dry sand of the coast, are some *rocks*, which dry, called the *Guards*.

Between Blancnez and Cape Grisnez, 16 fathoms is as near as a large vessel ought to stand in shore in thick weather, till you get Cape Grisnez to bear south, when you may haul in for it. Thence to Boulogne, the coast is clear all the way, within $\frac{1}{2}$ of a mile from the shore.

A lighthouse has been erected upon Cape Grisnez, from which a bright revolving light was first shown on the 1st of July, 1842. It is elevated 49 feet from the base, and 193 feet above the sea at high water; and may be seen, in clear weather, 8 leagues distant.

The new revolving light will be distinguished from that of Calais, by the difference of their respective intervals; that of Calais being 90 seconds, and that of Grisnez only 30 seconds: and further, the bright glares of Calais light are separated by perfect darkness, while in the intervals between those of Grisnez, a faint light will be visible to vessels within the distance of 4 leagues.

CALAIS ROAD lies considerably to the N.W. of the harbour, and is sheltered by a sand bank, of $3\frac{1}{2}$ fathoms, which begins at $2\frac{1}{2}$ miles N.W. by W. $\frac{1}{2}$ W. of Fort Lapin, and extends E.N.E. $\frac{1}{2}$ E., 3 miles. This is called the Riden of Calais. Ships may anchor near this bank, in from 10 to 13 fathoms. The best marks are, the great steeple on which the westernmost fort, and Blancnez 2 sails' breadth open of Calais land. The ground, composed of gravel, mixed with mud, is excellent for holding. At N.W. by W., 3 miles from the entrance of the harbour, are the westernmost of the shoals, called the *Ridens of the Road*, with $3\frac{1}{2}$ fathoms on them. To pass to the eastward of the Ridens, bring Calais to bear S. by E. There is also a good channel within them, nearly a mile wide, with from 8 to 10 fathoms in it.

CALAIS lies S.E. $\frac{1}{2}$ S., distant $22\frac{1}{2}$ miles from Dover; S.E. by S., $20\frac{1}{2}$ miles from the South Foreland; and nearly south, 23 miles from the Goodwin light-vessel. The town appears, on approaching it from sea, like an island, with 3 steeples and several windmills on it, one of the steeples being larger than the others.

The CITY OF CALAIS is built in the form of an oblong square, having the longer sides parallel to the sea. It has two gates: one towards the land, the other on the side of the harbour. A wall and moat surround the town, which is more than a mile in circumference; and it is defended by a strong citadel, in the midst of which, is the arsenal. About a mile to the westward of the arsenal, is Fort Nieulay, or Nieulet, a handsome fortress. There are also 5 other forts for the defence of the harbour and road. The entrance to the inner harbour is by the side of a wooden jetty, or pier, nearly a mile in length, not far from the extremity of which, on the western side, is Fort Rouge, and farther in, Fort Risban. About a mile to the westward of the citadel, is Fort Lapin; and to the eastward of the pier-head, about $\frac{1}{4}$ of a mile, is Fort Verte, erected upon piles, on a sandy beach; and serving for the defence of the north-eastern part of the town.

Calais is divided into three parts—the City, the Courgain, and the Suburbs. The City, or Town, is confined within the gates. The Courgain is comprehended within the bastion next to the harbour, in the north-east part of the town, and is the resort and residence of sailors and fishermen. The Suburbs, or Basse Ville, lies to the southward, and is on the outside of the ramparts.

Calais is but badly supplied with fresh water, there being neither springs or fountains. Rain-water is preserved in cisterns, which are very deep and large, being supported at the public expense.

The most remarkable objects on approaching the harbour are, the steeples of the Church of Notre Dame, the lighthouse, and the Town Hall, as shown in the view on the chart. The lighthouse, which is the central of the three towers, stands in the Grand Place, in the centre of the town, and exhibits a brilliant and revolving light, making its circular revolution in 90 seconds, constantly, from sun-set to sun-rise. This light is visible 7 leagues off. There is also a fixed tide-light shown on Fort Rouge, to the westward of the entrance of the harbour, elevated 32 feet 10 inches above the level of the sea, and may be seen, in clear weather, between 4 and 5 miles. This light is shown during the time there is a depth of 8 feet at the entrance between the jetties. In the day-time a flag is hoisted during the same period of tide. In foggy weather a bell is tolled, when these objects cannot be seen from the offing. The western jetty-head of Calais harbour has been recently extended 296 yards, and a small fixed light is now exhibited thereon, and visible 3 miles distant; but, in bad weather, it may be impossible to approach the extreme end of the jetty, and, in that case, it will not be lighted. This light will, when lighted, continue all night.

The harbour, within the pier, lies nearly east and west, and forms, at its western [NORTH SEA.]

part, a basin, commonly called the Basin of Paradise, containing quays and a wooden jetty, which is calculated to hold about 30 vessels of 160 tons; while the other parts of the harbour may contain 100 vessels of various sizes, even to sloops-of-war. But the entrance is too much obstructed by shallows to admit large ships, or even merchantmen, except at high water. The commerce carried on at Calais is, at all times, very considerable; but latterly, it has been more extensive. There are inland canals, communicating with St. Omer, Gravelines, Dunkirk, Ostend, &c., by which, goods and merchandize are easily and cheaply transported in boats.

Going into Calais harbour, which is rather dangerous with northerly winds, keep the mill at the east end of the town on with the jetty-head, and run in close by it, keeping the citadel to the west. Avoid the reef that runs from the western jetty; and when you are within the jetties, keep to the eastward for Paradise Basin, which is dry at low water. The tides run strongly here; and, as several ships' anchors lie in the way, it is hazardous to enter until near high water. The water at the jetty-head rises about 21 feet, and within the entrance from 15 to 18 feet, according to the winds: at neaps, about 8 feet. High water, full and change, at 11h. 30m. a.m.

It may be observed, generally, that the run from Dover to Calais will always be found shorter than from Calais to Dover, because the tide is always more favourable.

Five miles eastward of Calais, is Waldan, having a flat church, with a small spire-steeple. On each side of it appears a windmill and several houses. 2½ miles farther eastward, is Oye Church, with a larger spire-steeple; and a mill to the westward of it. 3¼ miles beyond the Church of Oye, is Gravelines. The land between is all low, the small sand hills making in hummocks. About midway, between Calais and Gravelines, the land rather projects, and is called Point d'Oye; to the eastward of which, is a tower and fort.

GRAVELINES.—The entrance to Gravelines is 10 miles E. ¾ S. from Calais. The church has a tall spiral-steeple; and the place is distinguished by two windmills, one of which stands on the east, and the other on the west side of the town. This town, which is about a mile from the coast, when viewed at a distance from the sea, appears like an island; the land on each side being low, and full of hummocks. A little to the eastward of the town stands an old monastery. As Gravelines harbour falls dry at low water, it cannot be entered but when the tide is high. There are two beacons, which, being brought on with each other, will lead you between the jetties. The marks for anchoring off Gravelines, to the westward of the banks, in the place called the Pit, are Gravelines steeple south, and Calais cliff W. ¼ S., in from 9 to 11 fathoms at low water, on coarse gravel.

Gravelines new lighthouse, from which a fixed light is exhibited, stands in latitude 51° 0' 18" north, and longitude, 2° 6' 48" east, of Greenwich, to the eastward of the pier-heads at the entrance to the harbour. The building is 83 feet high; and the light, being 95 feet above the level of the sea, will be visible from a ship's deck, at the distance of 5 leagues. There are also 2 tide-lights.

Five miles to the eastward of Gravelines, is Mardick Church; a mile before you come to which, is the entrance to Mardick Canal. Inland you will perceive the spire-steeple of Loon, with a mill on each side. Several other mills are visible hereabout, together with the steeples of Great and Little Synthe; the former being thick and flat, and the latter small and sharp-pointed.

Fort Mardick lies 3 miles beyond Mardick; and 2 miles beyond Mardick, is the entrance to Dunkirk.

DUNKIRK lies E. ¾ S., about 10 miles from Gravelines; and E. by S., 20 miles from Calais. It may readily be known by its square steeple, which is the highest of the kind on this part of the coast, and may be seen, in clear weather, 5 or 6 leagues off. The Stadt-house is a large square building, with a small spire, and stands near the church, being visible about 4 leagues off.

Between Calais and Dunkirk there is some high land in the country, called Mount Cassel. In clear weather, this land may be seen from the sea at a great distance, serving to distinguish this part of the coast. About the vicinity of Dunkirk, are several fortresses; and behind, inland, are the town and steeples of Bergues.

Dunkirk is a place of very considerable commerce—principally in corn, fish, home manufactures, and colonial produce. The approach is by a canal, 1½ mile in length,

the port and basin being in the interior of the town. The roadstead is at the outer extremity of the canal, and formed by a sand-bank, running parallel to the shore. The town is surrounded by a ditch; and, in general, well built. The houses are of a whitish brick, and seldom exceed two stories in height. The barracks are extensive and elegant; but there is a great scarcity of good fresh water. The new lighthouse stands in latitude $51^{\circ} 3'$ north, and longitude $2^{\circ} 22'$ east of Greenwich, on the head of the pier, between the harbour and Fort Risban; and 1531 yards, in a N.W. direction, from l'Heuguenar Tower. To a vessel distant 4 or 5 leagues, the light will appear to revolve, being eclipsed every minute; but, within that distance, a faint steady light will always be visible between the periods of the strong glare. The building is 180 feet high; and the light, being 193 feet above the level of the sea, will be visible from a ship's deck at the distance of 6 leagues. The harbour, or tide-light, stands upon the western jetty-head, and is 23 feet above the level of the high water mark, being visible 8 or 9 miles, when the weather is clear. The entrance to the harbour, which is dry at low water, is between the jetties, which have beacons on their extremities: the course in being about S. by E. $\frac{1}{4}$ E. High water, full and change, at 11h. 55m.; spring-tides rise 18 feet.

From Dunkirk the land extends E. $\frac{1}{4}$ N. towards Nieuport, the intermediate land being all low, with hillocks of sand fronting the sea. Within this space are the churches of Leffrinckoucke, Zuydcoote, Adinkercke, Furnes, and Wulpen. About 11 miles from Dunkirk, is a long white sand-hill, called *Broers Duyn*; which is somewhat more elevated than the adjacent sand-hills. Furnes, with its two spires of different heights, also stands back, and furnishes a good object to know this part of the coast by. The *Broers Duyn* has a barren appearance, differing from all the other hills, which are verdant; and it lies north, distant $2\frac{1}{2}$ miles from Furnes. Inland are canals, which communicate from Calais to Gravelines, Dunkirk, Furnes, Nieuport, Ostend, &c., as before mentioned.

NIEUPOORT is 15 miles from Dunkirk, 25 from Gravelines, and 35 from Calais. It is at present only fit for small vessels which are able to lie dry on a hard sand. The channel in is about $1\frac{1}{2}$ mile long, lying in a S.S.E. direction, very narrow, unsheltered on its western side, and not safe with strong winds. Nieuport has several steeples and mills, which appear from a distance like a fleet of ships; but there is one square church steeple, with a turret, which is very conspicuous, and larger than the rest. There is also a beacon and castle, and a small lighthouse, by which it will readily be distinguished. A tide-light is kept lighted when small vessels may pass over the bar, visible 5 miles off. High water, full and change, at 12h. Spring-tides rise 15 feet.

From Nieuport the shore continues to run E. by N., having near it the church of Lombarzede, with a high flat steeple; Westende, nearly a mile farther, has a spire-steeple; Middlekercke, 4 miles distant from Nieuport, and 5 from Ostend, with a high spire-steeple; Raversyde, $1\frac{1}{2}$ mile from Middlekercke, with a square flat steeple; and Mariekercke, $2\frac{1}{2}$ miles beyond Raversyde, with a small spire-steeple. About $3\frac{1}{2}$ miles from Raversyde, is Ostend.

OSTEND bears from Nieuport E. by N., distant 9 miles; from Dunkirk E. $\frac{1}{4}$ N., 24 miles; and from Calais east, 44 miles. Ostend appears, when at a distance, like an island. It has a church, with a large spire-steeple, a town-house, with a square tower on it, a high lighthouse, and three windmills; two of the mills may be seen very plainly, one at each end of the town; but the third seems to stand in the middle of the town, and, therefore, cannot be so easily discerned. Ostend lighthouse is situated near the end of the western jetty, in the N.E. corner of the town. The lantern has three reflectors fixed on the top of the column, which is 87 feet above the level of high water, and is visible at the distance of 3 leagues. There are two new tide-lights placed upon the eastern jetty; and a bell, which is rung in foggy weather, during tide time.

THE FLEMISH BANKS.

THE western parts of these banks are generally known by the title of the Dunkirk Banks. They are named as follow:—the Sandetie Bank, the Outer Ruytingen, the Inner Ruytingen, the Bergues, the Dyck, the Inner Ratel, the Outer Ratel, the Breedt

Bank, the Smal Bank, and that long narrow sand which bounds the road of Dunkirk to the northward, and is divided into the Snouw, the Braek Bank, the Hils Bank, and the Traepegeer.

THE SANDETIE BANK.—This is the outermost of the shoals, and is about 11 miles in length, and a mile in breadth in the broadest part. It runs in an E. by N. and W. by S. direction, having from 5 to 9 fathoms upon it; except a *patch* towards its western end, with only 3 and $3\frac{1}{2}$ fathoms upon it at low water, spring-tides. This shoal is a mile in length, and $\frac{1}{2}$ a mile in breadth, and must be carefully avoided, as it would be dangerous to approach it in a large ship, for the lead will not give you sufficient warning when either to the northward or southward of this shoal, as you will have 21 fathoms water within $\frac{1}{4}$ of a mile of its southern edge, and from 13 to 15 fathoms at the same distance from its northern edge. Close to its eastern and western sides, you will have 6 fathoms on the bank. The centre of this shoal lies with the following bearings, viz.:—Calais S.S.W. $\frac{1}{2}$ W., distant 15 miles; South Foreland lighthouse W. by N., distant 19 $\frac{1}{2}$ miles; and North Foreland lighthouse N.W. by N., 19 $\frac{1}{2}$ miles.

At $2\frac{1}{2}$ miles E. $\frac{1}{2}$ N. of the latter shoal, is a *patch*, with 5 fathoms on it, about a mile in length, and $\frac{1}{4}$ of a mile in breadth. Eastward of this you will have from 6 to 9 fathoms on the bank. Between the Sandetie and Outer Ruytingen, you will have from 22 to 14 fathoms, the deepest water being along the southern edge of the Sandetie; and it shoals gradually to the southward as you approach the Outer Ruytingen. The channel between these banks is 5 miles wide, with coarse sand, shells, and stones. In approaching the Sandetie Bank from the westward, you will have 20 or 22 fathoms water; but to the westward of the Outer Ruytingen, you will not have more than 12 or 15 fathoms.

THE OUTER RUYTINGEN is the second bank you will meet with as you come from the northward, extending from the meridian of Calais in an E. $\frac{3}{4}$ N. direction, 16 miles, and about a mile in width at its broadest part. On the north side of it you will have from 5 to 9 fathoms nearly the whole length of the bank. On its south side, which is steep-to, a *ridge of knolls*, with only 2 and 3 fathoms upon them, extend nearly the whole length, and are very dangerous to approach, even with small vessels, at low water. The most dangerous *shoal* on this bank lies near its west end, and has only 6 feet water on its shoalest part. From this spot Calais steeples bear S.W. $\frac{1}{2}$ S., distant 9 miles; and Gravelines S.S.E. $\frac{1}{2}$ E., 10 $\frac{1}{2}$ miles. The 3-fathom shoal on the Sandetie bears N. by E., distant $5\frac{1}{2}$ miles from the centre of this shoal; between which is a good clear channel, with from 14 to 22 fathoms in it, the deepest water being near the Sandetie. This shoal runs E. $\frac{1}{2}$ N. and W. $\frac{1}{2}$ S., $2\frac{1}{2}$ miles, and is $\frac{1}{2}$ a mile broad. From its west end, in 3 fathoms, Calais steeples will bear S.S.W. $\frac{3}{4}$ W., distant 8 miles; and Cape Blancnez S.W. by W., distant 11 miles. When Gravelines steeples bear S. by E. $\frac{1}{4}$ E., you may cross the bank, in from 5 to 7 fathoms, at low water. This will take you a mile to the eastward of the shoal. From the easternmost of the shoals, in $2\frac{1}{2}$ fathoms, on the east end of the Outer Ruytingen, Dunkirk bears S. by E. $\frac{1}{4}$ E., distant 12 miles; and Gravelines S.S.W. $\frac{3}{4}$ W., distant 12 $\frac{1}{2}$ miles.

THE INNER RUYTINGEN is an irregular bank, of uneven soundings, over which the sea is always very rough; and, therefore, should be avoided. Its western end, in 3 fathoms, lies about N. by W. from Dunkirk steeple: and its eastern part, in $2\frac{1}{2}$ fathoms, lies with Dunkirk steeple S. by W., distant 12 miles. Its direction is E.N.E. and W.S.W., being about 6 miles long. Its shoalest part, over which are only 9 feet, bears from Dunkirk nearly north, distant about 10 $\frac{1}{2}$ miles; and from Gravelines N.E., 13 miles. This is near the centre of the bank, where it is $2\frac{1}{2}$ miles in width, having not more than 3 fathoms on it.

Between the Outer and Inner Ruytingen, the depth of water is from 9 to 17 fathoms, the bottom being of sand, shells, and coarse gravel.

THE BERGUES.—One mile N.N.E. from the east end of the Inner Ruytingen, lies the southern edge of the *Bergues*, between which is a channel, of 10 fathoms. This bank runs nearly east and west, $4\frac{1}{4}$ miles, and is a mile in breadth, with 6, 7, and 8 fathoms upon it generally, with 16 and 17 fathoms close to the northward of it. There are two shoal *patches* on this bank, with only 3 and $3\frac{1}{2}$ fathoms upon them. They lie east and west of each other, distant 2 miles, with 7 and 8 fathoms between them. The western shoal lies from Dunkirk steeple N. by E., and the eastern one, which is the largest, lies from the same steeple N.N.E., distant 15 miles. These patches are the more dangerous, being at so great a distance from land.

The DYCK is a *long narrow bank*, formed in three divisions—the Western Dyck, the Middle Dyck, and the Eastern Dyck, or Clif Bank.

The western end of the West Dyck lies N.E. from Calais, distant 6 miles; thence it extends east, nearly 9 miles, with from $2\frac{1}{2}$ to 7 fathoms on it, the deepest water being on its west end. This bank is narrow, being not more than $\frac{1}{2}$ a mile wide in its broadest part; but the shoalest part, the west end of which lies N. by W. $\frac{1}{2}$ W. from Gravelines, distant 7 miles, and runs from thence eastward, 5 miles, is only a *narrow ridge*, about 2 cables' length in width. The shoalest part, with $2\frac{1}{2}$ fathoms on it, bears from Gravelines N. $\frac{1}{4}$ E., distant $6\frac{1}{2}$ miles. The western end of this bank may be crossed, in not less than $4\frac{1}{2}$ fathoms at low water, taking care not to bring Gravelines to the southward of S.S.E.

Between the Outer Ruytingen and the West Dyck are 14, 15, 16, and 17 fathoms water, the bottom being sand, small shells, and gravel.

The Middle Dyck, properly called the Dyck, is separated from the West Dyck by a narrow channel, of 4 and 5 fathoms. The western end of the Middle Dyck lies N.W. $\frac{1}{4}$ N. from Dunkirk, distant $9\frac{1}{2}$ miles; and N.N.E. $\frac{3}{4}$ E. from Gravelines, distant $6\frac{1}{2}$ miles. It thence extends about E. by N., 6 miles; its eastern extremity lying from Dunkirk nearly N. $\frac{1}{2}$ W., distant $7\frac{1}{2}$ miles; and from Gravelines N.E. $\frac{1}{4}$ E., $11\frac{1}{2}$ miles. The depths over the Dyck vary from 4 feet to 4 fathoms. Its shoalest part begins about a mile from its eastern end, and continues about $2\frac{1}{2}$ miles to the westward; the west end of the shoal part bears from Dunkirk N.W. by N., distant $7\frac{1}{2}$ miles; and from Gravelines N.E. $\frac{1}{4}$ N., distant 8 miles. The greatest breadth of the Dyck is nearly a mile. It lies $2\frac{1}{2}$ miles within the Outer Ruytingen, and the depth between varies from 11 to 17 fathoms.

The EASTERN DYCK, or CLIF BANK, is separated from the Middle Dyck by a channel a mile broad, with a depth of not less than $4\frac{1}{2}$ fathoms. The mark for this channel is, the church at Dunkirk, exactly midway between Bergues and Cassel, bearing about S. $\frac{1}{2}$ W.; but the mariner must be very careful of running on in this direction, since the same mark will lead directly upon the shoal part of the Inner Ruytingen. The S.W. end of the Eastern Dyck bears N. $\frac{1}{2}$ E. from Dunkirk, distant 8 miles; and N.E. by E. from Gravelines, distant 12 miles, Cassel appearing 1° open to the westward of Dunkirk. The general direction of the bank is N.E. by E., 13 or 14 miles. It continues exceedingly dangerous full 12 miles from its south-western part, or until you have brought Nieuport steeple to bear S. by E. Its shallowest part is near the S.W. extremity, where there are only from 5 to 9 feet water; and this extends until you bring Dunkirk to bear S.S.W. The breadth of the Eastern Dyck is about $\frac{3}{4}$ of a mile; and over it, to the northward of the shoal part above mentioned, are from 2 to 4 fathoms, until you have passed the marks already given; to the northward of which it suddenly deepens from 10 to 17 fathoms. Vessels in approaching this bank, should carefully keep the lead constantly going. The channel between the N.E. end of the Clif Bank and the S.W. end of the West Hinder, is $3\frac{1}{2}$ miles wide, from a depth of 5 fathoms on each, with from 15 to 18 fathoms in it.

The INNER RATEL lies to the southward of the Middle Dyck, its northern part being only separated by a narrow channel, but with 12 fathoms between them. Its western end is distant about $\frac{1}{4}$ of a mile from the Dyck, having from 4 to 5 fathoms on it, and lying from Dunkirk N.W. by N., distant $7\frac{1}{2}$ miles; and from Gravelines nearly N.E. $\frac{1}{4}$ E., distant 8 miles, extending thence E. $\frac{1}{4}$ N., about 7 miles. Its eastern end bears from Dunkirk N.N.E., a little easterly, distant $7\frac{1}{2}$ miles, and from Furnes N.W. $\frac{1}{2}$ N., $11\frac{1}{2}$ miles. The shoalest part of this bank is about the middle, extending more than 2 miles in the direction of the bank, and being almost a mile broad. The western extremity bears from Dunkirk steeple N. by W. $\frac{1}{2}$ W., and the eastern part N. $\frac{1}{4}$ E., or with Dunkirk just open to the westward of Cassel. There are generally from 10 to 3 feet over this bank; but only 2 feet in one part, which lies with Bergues and Dunkirk steeples in one.

The OUTER RATEL lies to the south-eastward of the Eastern Dyck, or Clif Bank, from which it is separated about $2\frac{1}{2}$ miles. Between them are from 7 to 12 fathoms. Its S.W. end lies to the northward of the N.E. end of the Breed Bank, the channel between being about a mile broad, with 6 to 9 fathoms in it. At this end of the Outer Rattel, is a *dangerous knoll*, $1\frac{1}{2}$ mile in length, with only 8 feet water over it. This bears from Dunkirk N.E. $\frac{1}{2}$ N., distant 10 miles, and N.N.W. from Furnes, dist-

ant $10\frac{1}{2}$ miles. From hence the Outer Ratel extends 8 miles, in the direction of N.E. by E. $\frac{1}{2}$ E., and is about a mile broad, with many *dangerous shallows* upon it, and should, therefore, always be approached with the greatest care and attention to the lead. The eastern end of the Outer Ratel bears from Furnes N. by E. $\frac{1}{2}$ E., distant 13 miles, and from Nieuport N. $\frac{3}{4}$ W., distant 11 miles. Near the N.E. end of the Outer Ratel are some small *knolls*, of 3 and 4 fathoms water, with 5, 6, and 7 fathoms round them. The furthestmost of these has 4 fathoms, and is full a mile off. There is also a narrow *shoal*, of 4 fathoms, to the northward of the N.E. end of the Ratel, distant 2 miles, the middle of which lies from Nieuport N. by W., distant 13 miles, and from Furnes N. by E., 15 miles. This shoal lies midway between the Outer Ratel and Eastern Dyck.

The BREEDT, or BROAD BANK, is the largest of the Dunkirk Banks; and, although divided into the West and East Breedt, it cannot be considered otherwise than one bank, having only 3 fathoms across it between the shoals. This part lies 5 miles N.N.E. from Dunkirk. The West Breedt extends E. $\frac{1}{2}$ S. and W. $\frac{1}{2}$ N., and is from 1 to 2 miles in width. The shoal part of this bank extends from the meridian of Dunkirk W. $\frac{1}{2}$ N., 8 miles, with 2 and $2\frac{1}{2}$ fathoms upon it; except two shoals, which nearly dry at low water. The west end of the shoal water lies from Dunkirk N.W. $\frac{1}{2}$ W., $8\frac{1}{2}$ miles, and from Gravelines N.E. by N., $5\frac{1}{2}$ miles. To the westward of this you will have 5, 6, and 7 fathoms on the bank, except a small *knoll*, of $3\frac{1}{2}$ fathoms, which lies from Gravelines N. by E., 5 miles. The western *shoal* on the Breedt Bank is a mile in length, and has only 2 and 3 feet water on it in some places. The centre of it lies from Dunkirk N.W. $\frac{1}{2}$ N., and from Gravelines N.E. $\frac{1}{2}$ E., 7 miles. Two miles eastward of this is the western edge of the middle *shoal*. This is an oval-shaped shoal, 2 miles in length, and $1\frac{1}{2}$ mile in breadth. The middle part of it nearly dries at low water. The west side of the shoal bears from Dunkirk N.N.W., and its east side N. $\frac{1}{2}$ E., distant 4 miles. The Breedt Bank is separated from the Inner Ratel by a narrow channel, with from 5 to 12 fathoms in it.

East Breedt may be said to commence in the meridian of Dunkirk. From thence it extends E.N.E., 5 miles. Its eastern end, in $3\frac{1}{2}$ fathoms, bears from Dunkirk N.E. $\frac{1}{2}$ E., nearly 10 miles. This bank has from 3 to 4 fathoms upon it, except a *narrow ridge*, which commences at its west end, and runs along the south side of the bank for 3 miles. This ridge has only from 2 to 6 feet water on it, and is about 2 cables' length in width. Its west end lies N.N.E. from Dunkirk, $4\frac{1}{2}$ miles, and its east end N.E., $7\frac{1}{2}$ miles.

The SMAL BANK lies within the Breedt Banks, its western end bearing from Dunkirk N. $\frac{1}{4}$ W., distant $3\frac{1}{2}$ miles, and from Zuydcoote N.W. $\frac{3}{4}$ W., nearly 7 miles. At this part are nearly 3 fathoms, the mark being Dunkirk in one with Cassel, bearing S. $\frac{1}{2}$ W., distant $3\frac{1}{2}$ miles; but as this is not a mile from a dangerous and shoal part of the Smal Bank, Dunkirk should never be brought to the westward of Cassel. From its western point, the *bank* stretches about 6 miles east, then E.N.E., $8\frac{1}{2}$ miles.

The shoal part of this bank is of great length, its western extreme commencing $3\frac{1}{2}$ miles N. by E. from Dunkirk, and continuing until its eastern end bears from Dunkirk N.E. by E. $\frac{1}{2}$ E., distant $10\frac{1}{2}$ miles, and from Furnes N. by W., $7\frac{1}{2}$ miles. Part of this dries at low water, to about the extent of $1\frac{1}{2}$ mile; the west and east ends bearing from Dunkirk from N.E. to N.E. by E., distant $4\frac{1}{2}$ miles. The other part of this shoal has from 1 to 10 feet over it, and is in general dangerous. The N.E. end of the Smal Bank bears from Furnes N. by E. $\frac{1}{2}$ E., distant 9 miles, and from Nieuport N. by W. $\frac{1}{2}$ W. Between the eastern end of the shoal and the N.E. end of the bank, are some *narrow patches*, of from 10 to 14 feet water, which will be noticed hereafter.

At about the distance of $6\frac{1}{2}$ miles north from Furnes, the Smal Bank unites with the Banks of Nieuport, by means of a *narrow shoal*, of from $2\frac{1}{2}$ to $3\frac{1}{2}$ fathoms water, and thus forms the northern boundary of Nieuport Road.

The INNER BANK, which stretches along the coast from Point Gravelines to Nieuport, and forms the northern boundary of Dunkirk Road, is divided into four parts, and distinguished by the names of the Snouw, Brack Bank, Hils Bank, and Traepegeer.

The SNOUW is the westernmost of these. Its western end bears from Gravelines N.E., $4\frac{1}{2}$ miles; from Dunkirk N.W. by W., $7\frac{1}{2}$ miles; and from Gravelines Point N. $\frac{1}{2}$ E., 2 miles. On it is placed a red buoy, in 4 fathoms water, intended to point

out the western entrance to Dunkirk Roads. From this buoy, the Snouw runs E.S.E., about $1\frac{1}{2}$ mile; then E. $\frac{1}{2}$ S., 3 miles. There are 4 and 3 fathoms over the west end of the Snouw, for the length of $1\frac{1}{2}$ mile eastward of the buoy, so that vessels may cross it in smooth weather, with Mardick Church bearing S. by E. $\frac{1}{2}$ E; but farther east than that, it is only passable for boats, its shoal part commencing N. by W. from Mardick, and N.E. $\frac{3}{4}$ E. from Gravelines. A small part of the Snouw dries at low water to the extent of $\frac{1}{4}$ of a mile. This part bears N.W. $\frac{1}{2}$ N. from Dunkirk, and N.N.E. $\frac{1}{2}$ E. from Mardick spire, distant from it $3\frac{1}{4}$ miles. The east end of the bank lies with Little Synthe and Cassel in one.

Besides the red buoy at the west end of the Snouw, there are, along the south edge of this bank, three black buoys, numbered 1, 2, and 3, which, with two white buoys on the northern edge of the *flat* that extends from the shore, called the *Polder*, point out the western channel into Dunkirk Road. The black buoy, No. 1, is nearly a mile E.S.E. from the red one, and lies in 5 fathoms water, with Mardick steeple bearing S. by E. $\frac{1}{2}$ E. In a direction E.S.E. $\frac{1}{2}$ E., $2\frac{1}{2}$ miles farther, is No. 2, at the end of a projecting tongue, in 4 fathoms water, with Mardick S.S.W. $\frac{3}{4}$ W, and Dunkirk steeple S.E.; and E. by S. more than a mile from this, No. 3 is placed, in $4\frac{1}{2}$ fathoms, with Mardick bearing S.W. $\frac{1}{2}$ W., and Dunkirk steeple S.E. $\frac{3}{4}$ S. The white buoy, No. 1, lies nearly $\frac{3}{4}$ of a mile S.S.W. $\frac{1}{2}$ W. from No. 2 black buoy, and E.S.E. $\frac{1}{2}$ S., $3\frac{1}{4}$ miles from the red buoy. No. 2, white, lies rather more than $\frac{1}{2}$ a mile S.S.W. from No. 3, black, and N.E. by E. $\frac{1}{2}$ E. from Mardick spire.

THE BRAEK BANK is only divided from the Snouw by a narrow channel, of 9 feet water. This passage bears from Dunkirk N.W. $\frac{3}{4}$ N., distant 4 miles, and from Mardick N.E. $\frac{3}{4}$ N., about the same distance; it thence extends E.S.E., for $2\frac{1}{2}$ miles, and nearly E. by S., $2\frac{1}{2}$ miles, where it joins the Hils Bank. The breadth of the Braek, at its western end, is not more than $\frac{1}{4}$ of a mile, which continues until it changes its direction to E. by S., when it suddenly becomes $\frac{3}{4}$ of a mile wide. The greatest depths upon it are only 6 feet water; and there are some places where it becomes dry at low spring-tides. These will be found to bear from Dunkirk from north to N.E. by N. The bank lies a full mile from the low water mark on shore.

HILS BANK, as before observed, is joined to the Braek, and limits the boundary of the eastern part of Dunkirk Road. It is very dangerous, not only on account of its shallowness and extent, but from the great depth of water close to its southern edge. Its general direction is parallel to the shore as far as its S.E. point, where there is a black buoy, in 13 feet water, bearing E.N.E. from Dunkirk steeple, and north from Zuydcoote steeple. A little more than a mile N.E. $\frac{3}{4}$ N. from this buoy, is another black buoy, on the N.E. point of the bank, in 16 feet water, bearing from Dunkirk steeple N.E. by E. $\frac{1}{2}$ E., and from Zuydcoote steeple N. by E. $\frac{1}{2}$ E. On the N.W. shoulder of the Traepegeer, a white buoy is also placed, $\frac{1}{2}$ a mile from the last-mentioned black buoy, in about 19 feet water. These buoys mark out the Zuydcoote, or eastern channel, in which the least depth is 18 feet; but, from the above white buoy to within $\frac{1}{4}$ of a mile of the S.E. black buoy, a long *spit* runs out, on which there are three *patches*, of only 6 to 9 feet water.

THE TRAEPEGEER BANK forms the east side of the Zuydcoote Channel, proceeding from the shore half-way between Dunkirk and Nieuport, and terminating Dunkirk Road. On this bank, near the Zuydcoote Channel, there is a small *knoll*, of 10 feet, bearing from Zuydcoote steeple N.N.E. Southward of this knoll is a narrow channel, of 6, 8, and 4 fathoms, running eastward nearly 2 miles; and from thence it irregularly shoals up to the beach. The northern edge of the Traepegeer, which forms the southern boundary of Nieuport Road, continues along shore at the distance of about 2 miles, and may be safely approached by the lead, until Furnes steeple comes on with Broers Duyn. To the eastward of this line, the Broers Bank rises suddenly to 9 feet from the N.E. prong of the Traepegeer, and should not be approached nearer than 5 fathoms at low water; though, between it and the shore, there is deeper water. After passing to the eastward of this shoal, which bears from Furnes N. by E., when Furnes bears S.S.W., the main shore may be safely borrowed upon by the lead.

NIEUPOORT AND OSTEND BANKS.

THESE shoals or banks consist of the Middlekercke, Nieuport, Ostend, Stroom, and Wenduin Banks.

The MIDDLEKERCKE BANK is situated almost 2 miles to the eastward of a bank which runs nearly parallel with it, and was formerly named the East Breedt. Between these banks, is the North Channel, with from 5 to 12 fathoms in it. Middlekercke Bank lies nearly N.E. and S.W., extending 6 miles, and is composed of several patches of sand, on the shallowest of which are never less than $2\frac{1}{2}$ fathoms. Its southern part lies north, a little easterly, from Nieuport steeple, distant 7 miles. Its northern extremity bears from Nieuport N.N.E. $\frac{1}{4}$ E., distant 12 miles; and from Ostend steeple N. by W. $\frac{3}{4}$ W., 8 miles: but its shoalest part, of $2\frac{1}{2}$ fathoms, bears from Nieuport N. by E., distant 8 miles; and from Ostend N.W. $\frac{1}{4}$ W., distant 8 miles. North-eastward of this you will have from 3 to $4\frac{1}{2}$ fathoms on the bank. The irregularity of soundings always occasions a heavy sea upon the Middlekercke Bank.

The bank which lies to the westward of the Middlekercke Bank, runs N.E. by E. and S.W. by W., and is 3 miles in length, with from $2\frac{1}{2}$ to 4 fathoms on it: indeed, it may be said, to extend farther; for about $\frac{1}{2}$ a mile N.E. by E. from it is a *spot*, of 4 fathoms, with from 5 to 6 fathoms between them. There is also a *patch*, of $3\frac{1}{2}$ fathoms, lying E.S.E. from the N.E. end of the bank, distant about $\frac{1}{2}$ a mile, with 8 fathoms between them. The mark for the western end of this bank is Furnes steeple S. $\frac{3}{4}$ W., distant $10\frac{1}{2}$ miles. The shoal, of 4 fathoms, off its east end, bears from Furnes steeple N.N.E. $\frac{1}{4}$ E., distant 13 miles; and the patch, of $3\frac{1}{2}$ fathoms, bears from Nieuport N. $\frac{1}{4}$ E., distant 10 miles.

The NIEUPOORT BANK is a mile to the southward of the Middlekercke, and may be considered a continuation of the Smal Bank, being connected by a channel, of from 3 to 4 fathoms water in it. It also connects itself with the Stroom Bank, when bearing from Ostend W.N.W. $\frac{1}{4}$ W., by a depth of from 3 to 4 fathoms. The western part of the Nieuport Bank bears N.W. from Nieuport; and north, 6 miles from Furnes. Between this point and the Smal Bank is a *bar*, in length a mile, and from 1 to 3 cables' length in breadth, which joins the Nieuport to the Smal, by a depth of from $2\frac{1}{2}$ to 3 fathoms. Vessels must cross this bar, to enter or quit Nieuport Road, by the northern channel, the mark for crossing it being Furnes steeples open to the westward of Broers Duyn, bearing south.

Nieuport Bank extends from the western end E.N.E. $\frac{1}{4}$ E., $9\frac{1}{2}$ miles; its eastern end bearing from Ostend N.W. $\frac{1}{4}$ W., distant 5 miles: and from Nieuport N.E. by N., distant $7\frac{1}{2}$ miles. The broadest part of Nieuport Bank may be $\frac{3}{4}$ of a mile; and the shoal part of the bank, which is 3 miles long, lies between N.N.E. and N.N.W. from Nieuport, the least soundings on it being 6 feet.

OSTEND BANK is situated about $1\frac{1}{2}$ mile to the eastward of Middlekercke Bank. Its S.W. end bears from Ostend N.W. $\frac{1}{4}$ W., distant 6 miles; and from Nieuport N.N.E. $\frac{1}{4}$ E., $8\frac{1}{2}$ miles; thence extending E.N.E., 6 miles. Its N.E. end bears from Ostend N. $\frac{1}{4}$ E., distant 7 miles; and from Nieuport N.E. $\frac{1}{4}$ N., distant 13 miles. The northern end of this bank is very narrow, with 3 and 4 fathoms over it; but between its S.W. end, and that part bearing between N.N.W. $\frac{1}{4}$ W. and N.W. $\frac{1}{4}$ N. from Ostend, it becomes broad; and there are several *patches*, with only 13, 14, and 15 feet water. To the south-westward it approaches within $\frac{3}{4}$ of a mile of the Nieuport Bank, having 4 fathoms water over it, and $4\frac{1}{2}$ fathoms between them. It then stretches to the eastward, and joins the Wenduin Bank by a swashway, of from $3\frac{3}{4}$ to 4 fathoms, N.N.W., $4\frac{1}{2}$ miles from Ostend. The soundings being so irregular on this bank, causes (as on the Middlekercke) a great sea; and although not less than $2\frac{1}{2}$ fathoms has yet been discovered upon it, yet, very probably, there may be other patches of less water; and the heavy sea which, when the wind is from the northward, rolls over these banks with such violence, may cause them to shift their position, increasing and decreasing their depths alternately.

The **STROOM** is a *dangerous bank*, stretching along the shore from Nieuport to Ostend, and separates the Little from the Great Road of Ostend, joining the bank on the shore to the eastward of Ostend. The western part of this bank has 4 fathoms water, and bears from Nieuport N. by W., distant $2\frac{1}{2}$ miles from the beacon; the mark for this end being, Nieuport beacon and spire in one. It is $\frac{1}{2}$ a mile distant from Nieuport Bank, and separated by a depth of 5 and 6 fathoms, and $\frac{3}{4}$ of a mile from the bank of 3 and $3\frac{1}{2}$ fathoms, which lines the shore. Between these are 5 fathoms; on the edge of the bank 4; decreasing towards Nieuport to 3, 2, and 1 fathom. The general direction of the Stroom Bank is E. $\frac{1}{2}$ N., its southern edge approaching within $\frac{1}{4}$ of a mile of the jetty at Ostend. The dangerous part of the Stroom Shoal begins N. by E. $\frac{1}{4}$ E. from Nieuport, and continues to shoal as it advances to the eastward. In some places there are uncertain swashes, while in others there are not more than 3 feet water. The southern edge is very steep, and consequently dangerous; but the soundings from thence towards the coast, are regular, and will guide any vessel working into the little road of Ostend.

Little Ostend Road lies to the southward of the Stroom Bank; Great Ostend Road is between the Stroom and Ostend Banks.

The **WENDUIN BANK** is situated between Ostend and Wenduin. Its western end bears N. by W., $3\frac{1}{2}$ miles from Ostend, and has 3 fathoms water over it. Thence it extends east, a little northerly, about 7 miles, and terminates $2\frac{1}{2}$ miles from Blankenberg, Blankenberg then bearing S.S.E. $\frac{1}{2}$ E. The shoal part of the Wenduin Bank is very narrow, and runs parallel to the coast, extending 2 miles, and having $1\frac{1}{2}$ fathom water over it. Its western end bears from Ostend N.E. $\frac{1}{2}$ N., distant 5 miles; and from Blankenberg W.N.W., distant $6\frac{1}{2}$ miles. Its eastern end bears from Ostend N.E. $\frac{1}{4}$ E., 7 miles; and from Blankenberg N.W. by W. $\frac{1}{2}$ W., $4\frac{1}{2}$ miles.

DIRECTIONS FOR SAILING BETWEEN CALAIS AND OSTEND.

VESSELS coming from the westward, should endeavour to make the land a little to the westward of Calais, somewhere about Cape Grisnez or Cape Blancnez, that part being elevated, and more readily to be distinguished: and when proceeding towards Dunkirk, may run along shore, from Cape Grisnez so far as Oye, in from 18 to 14 fathoms water, at the distance of 4 miles from the land; by which they will avoid the Ligne, Quenocs, and Riden Banks; and leave, on the port or larboard side, the shoal of 6 feet, on the west end of the Outer Ruytingen, and also the western part of the West Dyck. When in the meridian of Calais, you may haul more in shore. Should you be bound to Calais, as soon as it bears S. by E., you may steer for it, as you will then be the eastward of the Ridens. In working between the above shoal and the shore, care must be taken to avoid it; and when Oye bears S.S.E., you may stand in nearer to the land, until you are within $1\frac{1}{2}$ mile of the shore. Run along at that distance, steering E. $\frac{1}{2}$ S., until you reach the red buoy on the western end of the Snouw. Your soundings will show your approach to the coast between Oye and Gravelines. Vessels coming in from the northward, should not bring Calais steeples to the westward of S. by W. $\frac{1}{4}$ W., in order to avoid the shallow part of the Sandetie, on which are only 3 fathoms at low water. This bearing will only take you $1\frac{1}{2}$ mile to the westward of the shoal; passing which, you should not go to the eastward of the meridian of Calais, until you are as far to the southward as the West Dyck, in order to avoid the 6-feet shoal on the Outer Ruytingen; and when within 5 or 6 miles of Calais, you may steer for Gravelines, and thence to Dunkirk Road.

In going into the harbour of Calais, which is somewhat dangerous with northerly winds, keep the mill, which stands at the east end of the town, on with the eastern jetty-head, and run in close by the jetty, the water being very shallow near the opposite side, the whole way in. When within the jetties, keep to the eastward for Paradise Basin, where you will lie dry at low water. As the tides run strong, it will be hazardous to attempt the entrance until near high water. The water at the jetty-head rises 21 feet, and within the harbour from 15 to 18 feet; but this rise will depend

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upon the winds. So soon as there are 8 or 9 feet water in the harbour, notice is given by hoisting a flag by day, and by a light at night upon, the jetty-head. This signal is gradually hoisted, according to the progressive rising of the water, and kept up until the water has fallen to the same depth on the ebb-tide, similar to a regulation observed at Dover. On the days of the new and full moon, it is high water at 11h. 30m.

If, with a ship of great draught of water, you are obliged to work into the road between Oye and Gravelines, be careful to avoid the *Western Dyck*, over which are only 3 fathoms water. It lies $4\frac{1}{2}$ miles from the coast, and is steep-to, having close to its edge from 13 to 15 fathoms, and between it and the shore from 9 to 15 fathoms, the ground rocky, with shells. Midway of this space, when sailing to the eastward, you will find a depth of $6\frac{1}{2}$ fathoms, this being a continuation of the Breedt Bank. As you approach the entrance to the road, your soundings will change to sand and oaze.

A frigate, coming from the northward, may safely cross the Outer Ruytingen and West Dyck, if she keep Calais bearing S.W. This bearing will keep you to the eastward of the shoal on the Outer Ruytingen, in not less than 6 fathoms water, nor less than $4\frac{1}{2}$ or 5 fathoms on crossing the West Dyck. Although in the above course there would be sufficient water for a large ship, it is strongly recommended for all vessels of a heavy draught of water, to pass to the westward of all the shoals, by keeping Calais S. by W. $\frac{1}{2}$ W. Ships bound for the North Sea, should not bring Calais to the westward of the above bearing, until the South Foreland bears W. $\frac{1}{2}$ N. They may then shape a course to the north-eastward.

The port of Gravelines is only capable of accommodating very small vessels; and the channel to Mardick is stopped up. A new lighthouse, showing a fixed light, has been erected at Gravelines, which may be seen 6 leagues. There are also 2 tide-lights.

DUNKIRK ROAD is bounded by the Snouw, Braek, Hils, and Traepegeer Banks, and the bank which lines the shore, its length being about 12 miles. From the red buoy at the western end of the Snouw, to Dunkirk, the distance is $7\frac{1}{2}$ miles, the road running E. by S. $\frac{1}{4}$ S. and W. by N. $\frac{1}{4}$ N. It thence continues nearly east and west, $4\frac{1}{2}$ miles farther, or so far as Zuydcoote Channel. Its breadth, from northward to southward, it not more than $\frac{1}{2}$ a mile; in some places not so broad; that is, with a depth of 4 fathoms. The soundings are from 7 to $8\frac{1}{2}$ fathoms, with a bottom of mud and sand, which holds well. This road, however, is only sheltered by the surrounding banks, which are always under water, and is, as has been shown, very narrow, therefore fit only for vessels bound to that port; but as it is the nearest shelter for vessels coming from the British Channel, in cases of necessity to resort to, we shall describe the route which may be taken in going there. The banks to the northward are steep throughout; and so is the in-shore one, from Gravelines to Dunkirk. To the eastward the soundings will indicate your approach towards the in-shore one.

The WESTERN PASSAGE is pointed out by 6 buoys, which have been described in page 135. The first, or western one (red) lies at the western end of the Snouw; three black ones, marked 1, 2, and 3, lie on the southern edge of the same sand; and on the opposite side, are two white ones, placed on the northern edge of the in-shore sand, which here takes the name of the *Polder*. A vessel should first make for the red buoy, as already directed, which lies in 5 fathoms water, $4\frac{1}{2}$ miles N.E. from Gravelines spire; and N. $\frac{1}{2}$ E., 2 miles from the Downs at Gravelines Point. You are to leave this buoy to the port or larboard. Being about $2\frac{1}{2}$ cables' length to the southward of this red buoy, and in from 8 to 9 fathoms water, Gravelines bearing S.W. $\frac{1}{4}$ W., and Dunkirk S.E. by E., steer E.S.E., passing between the black buoy, No. 1, of the Snouw and the white buoy, No. 1, of the Polder. This white buoy is so placed to show the boundary of the channel to the southward, and the old entrance to Mardick. When you have advanced so far as to bring Gravelines Point to bear S.S.W., take great care to avoid going to the southward of the two white buoys, for, by so doing, you may run upon the west end of the Polder, which has over it from 9 to 6 feet; this end bears from Mardick N. by W. $\frac{1}{4}$ W., and from Gravelines spire N.E. by E. $\frac{1}{4}$ E., being $\frac{1}{2}$ a mile to the eastward of the white buoy, No. 1. When in mid-channel, between these two buoys, if with a large ship, the course should be E. by S. $\frac{1}{4}$ S., 1 or $1\frac{1}{2}$ mile, or until you come equi-distant between these and the next two buoys; you will then perceive the black buoy, No. 2, and the white buoy, No. 2, and can steer directly between them.

A small vessel which has arrived between the white and black buoys, Nos. 1, can

proceed eastward without danger. But a ship of great draught of water must wait until half-flood.

Having advanced to between the black and white buoys, numbered 2, you will have passed a *sandy bar*, over which are from 5 to 5½ fathoms, between the eastern part of the Snouw and Polder; you will then be in the road, and may anchor. There is a black buoy, marked No. 3, lying 1½ mile E. by S. ½ S. from the black buoy, No. 2. This will point out the dangerous part and southern edge of the bank, showing also the anchorage. In coming from the westward, the red and three black buoys must be left to your port or larboard, and the two white buoys to your starboard. Between the red buoy and the bank which joins the shore, are from 7 to 8 fathoms water. From thence, easterly, the depth increases to 10 fathoms, and decreases again till you have passed the bar of 6 fathoms, which begins westward of the black buoy, No. 2, and joins the Polder. About 2 cables' length to the westward of the white buoy, No. 2, and W.N.W. ½ W. from the black buoy, No. 2, is a small *patch*, with only 3 fathoms over it. To the northward of this it is dangerous to pass, although there is a depth of 7 fathoms. Having crossed the bar, you will find your soundings increase; and, when abreast of the black buoy, No. 3, there are from 6 to 7 fathoms. The customary anchorage is between the beacons of Dunkirk and the black buoy, No. 3, fine sand and oaze, holding well. Here you can take the advantage of the flood to enter the port; and the communication with the shore is easy. To the eastward of the jetties there is more mud, but vessels seldom anchor there, although the shelter from the north and N.W. winds is greater, and the ground must hold well; but it is advisable for ships, in strong northerly gales, when unable to get into the port, to anchor between Dunkirk and Zuydcoote, because, in case of emergency, it will be less dangerous to run on shore there than to the westward. Vessels drawing 13, 14, or 15 feet, may run into the port at high water, the entrance drying at low water, spring-tide; but those of greater draught must discharge their cargoes in the road. The jetties run out N. by W. ¾ W. To the eastward of the jetty, the bank, which joins the shore, rises gradually, so that the soundings will sufficiently point out your approach toward it. When the wind blows from the northward or westward, it generally occasions a heavy sea in Dunkirk Roads.

The EASTERN, or ZUYDCOOTE CHANNEL, lies in a N.E. ¼ N. and S.W. ¼ S. direction, between the Hils and Traepeer Banks, and is distinguished by two black buoys and one white, a black buoy being placed at the N.E. end, and another on the S.E. edge of the Hils Bank: the white buoy lies on the N.W. end of the Traepeer. These have been described in page 135. In sailing from Dunkirk Road to Nieuport, Ostend, or Flushing, you will proceed through the Zuydcoote Channel, leaving these two black buoys on your port or larboard side, and taking care to have the white buoy to the starboard: here your depth will be from 3 to 4 fathoms; but you should endeavour to pass nearer the black buoys, on account of the small *knoll* of 10 feet, which has already been noticed, and which bears from S.E. point of Hils Bank E.N.E. ¾ E., distant 3 cables' length. Being nearly midway between the two black buoys, you will clear this shoal; and steering toward the white buoy, will pass to the northward, at the distance of 2 or 3 cables' length.

Large vessels should not attempt going through the Zuydcoote Channel without a fair wind, and at high water. Small ships drawing less than 18 feet, may run through with safety, even should the buoys be removed, by bringing Leffrinckoucke steeple as much open to the eastward of the great steeple of Bergues, as that steeple will be to the eastward of the little steeple; or if the weather should be hazy, and the steeples cannot be seen, then the steeple of Zuydcoote, bearing S.S.W., a little southerly, will carry you through. At high water, a small vessel may pass with the above marks, only taking care not to bring Leffrinckoucke steeple to the westward of the little steeple of Bergues, as by so doing, there would be danger of being set on the *knoll*, of 10 feet, which bears N.N.E., distant 2½ miles from Zuydcoote. Thus, having passed safely through the Zuydcoote Channel, you will reach the western end of Nieuport Roads, and have from 5 to 8 fathoms water. But as the Smal Bank in that part is steep-to and dangerous, and not above ½ a mile distant from the black buoy, when you have passed the white buoy, your course through Nieuport Road is E. ½ N.

Vessels drawing less than 11 feet water, when entering the Zuydcoote Channel, if unable to distinguish the colour of the first buoy they meet with, should endeavour to pass close to the eastward of it; for if it should be the white buoy, there will be suffi-

cient water for them $\frac{1}{2}$ a mile to the eastward of it: but if the black buoy, it will then direct them to the middle of the channel. Strangers may always obtain a pilot, who will conduct them to the anchorage.

NIEUPOORT ROAD is bounded to the northward by the eastern part of the Smal Bank and western end of the Nieuport Bank, to the eastward by the Stroom, and to the southward by the Traepegeer. It is 8 miles long, running E. $\frac{1}{4}$ N.; and its breadth at the eastern part, and from thence to within 2 miles of Zuydcoote Channel, is about $1\frac{1}{4}$ mile. In it is a depth of from 7 to 10 fathoms, the ground being sand and mud, and holding well. To the northward of Zuydcoote Channel the breadth of the road is not more than $\frac{1}{2}$ a mile; and, as before observed, you must be cautious how you approach the Smal Bank, close to the edge of which are 8 fathoms water. The road may be said to go still more to the westward, so far as the place where the Hils and Smal Banks unite. The mark for the eastern part of the road, is Nieuport steeple in a line with the beacon at the entrance of the port. Here also the Stroom Bank begins—in short, Nieuport Road is completely enclosed by the banks; and there is no good passage into it for large vessels at low water. The best way to approach it is by Dundirk Road, for the following reasons:—

The Northern Channel, or passage out to seaward, is between the Smal and Nieuport Banks, the Middlekercke Bank, and a bank lying 2 miles to the westward of it, and lies in the direction of N.E. $\frac{1}{2}$ E. and S.W. $\frac{1}{2}$ W., being 10 miles long and 1 broad. This channel extends out too far from the shore for any object on land to be visible; and would be very difficult to enter Nieuport Road by, without either leading-mark or buoys: it is, therefore, very little frequented, unless in leaving the port; and then you must have fair weather and a spring-tide. In adopting this passage, bring Furnes on with the west side of Broers Duyn, bearing about south, and keep it so until you have crossed the bar which joins Nieuport and the Smal Banks together. This bar you will find $1\frac{1}{4}$ mile long, and 3 cables' length broad, with a depth of from 3 to 4 fathoms. Immediately when you deepen your water to 4 or $4\frac{1}{2}$ fathoms, make good a N.E. $\frac{1}{2}$ E. course, and run on for 12 or 13 miles, which will carry you clear to the northward of all the banks.

The first part of the channel between the N.E. part of the Smal Bank and the S.W. part of the Nieuport Bank, is narrow, with from 5 to 6 fathoms, but may be borrowed upon by the lead. Between Middlekercke Banks and the bank lying to the westward of it, the channel becomes wider, with from 6 to 10 fathoms.

Vessels drawing only 12 feet water, may go over to the western part of the Nieuport Bank at a quarter-flood, with Nieuport steeple bearing S.S.E., but not more southerly, as that bank shoals suddenly. They may then stand out to the northward, without regarding Middlekercke Banks, if the water be smooth.

The north-east passage lies between the Nieuport and Stroom Banks. This channel is 5 miles long, lies in an E. by N. direction, is about $\frac{1}{2}$ a mile broad, and the only communication between Nieuport and Ostend Great Road. Vessels drawing 12 or 13 feet may work through, only avoiding the shoal part of the Nieuport Bank; but larger ships must not attempt it, until the sea is elevated some feet, and they obtain a leading wind. To sail through, bring the spire and beacon of Nieuport in one, and sail on thus, until Middlekercke comes S.E. by E. $\frac{1}{2}$ E., and Furnes S.S.W. $\frac{1}{4}$ W.; you will then be in from 5 to 6 fathoms water, and at the entrance of the channel, the bottom being sand and mud; whence steer E. by N., about 5 miles, and you will be in Ostend Great Road. In sailing thus you will have from 4 to 5 fathoms, for the distance of 3 miles, and then from $2\frac{1}{2}$ to 4 fathoms at low water; this latter depth will be when you are crossing that part which unites the Stroom and Nieuport Banks, Ostend then bearing E.S.E. $\frac{1}{2}$ E., beyond which the depth increases to 5 and 6 fathoms.

To sail from Ostend Great Road to Nieuport Road, by the N.E. passage, bring Ostend to bear S.E. by E. $\frac{1}{2}$ E., Nieuport S.W. by S., and Middlekercke south, a little easterly; then steer W. by S., until you bring Nieuport spire and beacon in one.

Eastern Channel.—To sail out of Nieuport Road, by the Eastern Channel, you must pass between the Stroom Bank and the shore, through Little Ostend Road. Be careful to avoid the shoal part of the Stroom Bank, which is steep-to; and, working along, your soundings will point out your too near approach to the coast. When you have got the beacon and steeple of Nieuport in one, Furnes bearing S.W. $\frac{1}{2}$ S., and Middlekercke

E.S.E. $\frac{1}{2}$ E., you will have 5 fathoms water, and be at the entrance of the Eastern Channel; then steer E. $\frac{1}{2}$ N., 9 miles, and you will pass near the jetties of Ostend; but in this passage be careful to avoid the Stroom Bank, which is steep-to, although the bank from the shore may be safely approached by the lead.

NIEUPOORT, we have already mentioned, is fit only for very small vessels; and the mariner unacquainted with the channel, should not attempt an entrance without a pilot. The jetty may be approached to $\frac{1}{4}$ of a mile distance, where there are from 3 to $3\frac{1}{2}$ fathoms water; but on approaching the bar, this depth rapidly decreases. Vessels compelled to run in, should pass close to the westward of the jetty, following the direction of the channel, where, if no pilot is to be obtained, they may take the sands on the western side. It is high water, on full and change days, at 12h. Spring-tides rise from 15 to 18 feet; neaps from 14 to 15 feet.

ROADS of OSTEND.—There is a great and a little road. The former is situated between the Nieuport, Ostend, Wenduin, and Stroom Banks; and lies E. by N. and W. by S., being 7 miles long and a mile broad, with a depth of from $4\frac{1}{2}$ to 6 fathoms, on sand, and oazy ground. It is here, about $2\frac{1}{2}$ miles off shore, that large ships, bound to Ostend, generally anchor, and wait a wind or tide to enter the port.

In coming from the northward for the GREAT ROAD of OSTEND, you must, with a large vessel, cross the Ostend Banks. But at night it is advisable, when they have made the light, either to stand off and on till day, or to anchor, in 7 or 8 fathoms, to the north-eastward of the lighthouse. The soundings will then sufficiently apprise them of their too near approach to the Wenduin Bank. This light can be seen full 3 miles off—a distance sufficient for them to guard against the banks, as well as to those who, bound to Ostend, are desirous of anchoring in the Great Road; but small vessels, drawing less than 13 feet, may safely run into the Great Road, by keeping between N. by W. and N.N.W. $\frac{1}{2}$ W. from the lighthouse. In no part of their progress will they have much less than 3 fathoms, unless the Ostend Bank should shift its present position,—a circumstance by no means unlikely. Smaller vessels need only keep between N.E. by N. and N.W. by W. $\frac{1}{2}$ W. from the lighthouse. If, in the Great Road, you are caught in a gale of wind from the south-westward, you should immediately regain the offing; if from between north and west, then run for the Scheld. Should a large vessel, in the middle of the Great Road, be obliged to run for the Scheld, she should steer E. $\frac{1}{2}$ N., in order to pass to the southward of the Wenduin Bank; and when N. by E. from Wenduin Church, may edge over into the Weilinge Channel. It is highly prudent to guard against westerly winds; but those from the eastward are seldom dangerous. A pilot is commonly taken here, or at Blankenberg, for the port of Ostend. Vessels bound to the Great Ostend Road, may enter between the Middlekirk and Ostend Banks, having the steeples of Furnes and Oost Dunkirk in a line, bearing S.W. $\frac{1}{2}$ S., until Ostend lighthouse comes S.E. The last mark leads into the road, where you may anchor, with the great steeple of Ostend bearing S.E., and Nieuport steeple just within a large sand-hill, nearly S.W., in $5\frac{1}{2}$ or 6 fathoms, about $2\frac{1}{2}$ miles from the shore. There is also good riding more to the eastward, within Ostend Bank, on clayey ground, in 6 fathoms, with the body of the town of Ostend S. by E.; Middlekirk S.W.; and Blankenberg E. by S.

To sail from the Outer to the Inner Road, small vessels commonly cross the Stroom Bank, with Ostend Town Hall bearing S.E.; but to do so, they should take half-flood, as on this part of the Stroom you will only have from 3 to 6 feet at low water, spring-tides.

LITTLE OSTEND ROAD, as before described, lies to the southward of the Stroom Bank, and between that and the bank which lines the shore. Its ground is not good, particularly near the harbour, and, therefore, vessels should not run for it in foul weather, except when driven by necessity; but, in fair weather, when coming from the northward, or from the Great Road, you must enter it from the westward, in order to take advantage of the flood in entering the harbour. To do this, a small vessel may cross the western end of the Stroom, in not less than 12 feet, by keeping Westende steeple S. by W., but not farther westward. Vessels drawing more than 14 feet, must beware of the *flat*, of 14, 15, and 16 feet, which extends N.N.E. $\frac{3}{4}$ E. from Westende steeple, full a mile out. This flat continues stretching along towards the shore, narrowing its limits until it reaches Ostend Jetty. Between Westende and Ravershyde are from 15 to 22 feet water near its edge; but these depths continue no farther than

Mariekerke. Opposite Ostend are not more than 20 feet water, and still less to the eastward, where the Stroom Banks nearly unite with the shore, about $1\frac{1}{2}$ mile to the eastward of the jetty, there being only 15 or 16 feet; but beyond this, to the eastward, you find 15 to 18 feet a mile off the shore. Merchant-vessels, drawing 12 or 13 feet water, may come as near as 6 miles from the shore, any where between Nieuport and Blankenberg, without danger, for the banks of Ostend and Middlekerke have sufficient water for them to pass safely over, except at very low spring-tides, where 2 or 3 small spots, of 15 feet, have been found, and the Nieuport and Wenduin Banks will be to the southward of them.

THE HARBOUR OF OSTEND.—Vessels intending to enter the harbour of Ostend, should keep to the westward, until there is sufficient water on the bar for their purpose, because, after full sea in this port, the flood runs a long time to the eastward. There is a lighthouse near the western jetty. There are now two lights placed upon the eastern jetty. There is generally a pilot-vessel lying at sea, with a blue flag hoisted; and, at proper periods of the tide, flags are hoisted near the lighthouse, which have the following significations:—a small blue flag shows when there is a depth of 14 feet over the bar; a large blue flag when there are 17 feet; and a red flag when there are 24 feet. Should the weather prevent a pilot coming on board, and the wind blows hard from the northward, so as to compel you to run for the harbour, then keep the church well open to the westward of the lighthouse on the western side of the harbour; and, on approaching the bar, bring the two flag-staffs and the eastern jetty in a line, and they will lead you over the bar, in the deepest water. On entering the harbour, pass close to the eastern jetty, and take care the stream does not drive you to the eastward of it; run on so far as the inner end of the jetty, and warp to a convenient berth. By night, bring the two lights, which are then exhibited upon the eastern pier-head, in one, and they will carry you over the bar; and it may be observed, that the Stroom Bank can always be crossed when you can go over the bar. A bell is placed near the tide-light, upon the battery of the east pier-head, and will signalize, in foggy weather, the approach to the entrance of this port, as follows:—as soon as there are 4 metres 40 centimetres (16 feet of Ostend) water on the bar at the entrance of the harbour, the bell will be rung every $\frac{1}{4}$ of an hour during five minutes, until the water has fallen to 4 metres 40 centimetres (16 feet of Ostend). It is high water, on full and change days, at Oh. 20m. P. M. Spring-tides rise from 15 to 17 feet, neaps from 13 to 15 feet.

Note.—Every commander going into the harbour of Ostend, is required to take a pilot, or pay for one.

Ships coming from the westward, and bound to Ostend or the Scheld, who may be desirous of passing on the outside of the banks, should, when Cape Grisnez bears S.E., distant 5 miles, steer N.E. by E., 33 miles, allowing for the set of the tides, by which they will pass 3 miles to the north-westward of the Sandetie Shoal, of 3 fathoms, and get into the latitude of $51^{\circ} 22'$, which is to the northward of all the banks already described; keep in this latitude, with the lead constantly going, and, at the distance of 16 or 17 miles, they will find 17 fathoms, about mid-channel, between the N.E. end of the Clif Bank and the S.W. end of the Hinder Bank. As this channel is not more than 4 miles wide from the depth of 4 fathoms on each side, it is advisable to pass through it by day-light, as the shoal water generally shows itself.

In clear weather, and under favourable circumstances, when a good departure can be taken, you may safely pass to the southward of the Sandetie, by which the distance will be shortened. When Cape Blancnez bears S.S.W., distant 10 miles, and the South Foreland N.W. by W., you will have 22 fathoms water; from thence, an E. $\frac{1}{4}$ N. course for 31 miles, will bring you to the before-mentioned situation, between the West Hinder and Clif Bank, in 17 fathoms. In steering the before-mentioned course, you will pass nearly 3 miles to the northward of the Outer Ruytingen and Bergues Banks.

By continuing to run eastward, in the same parallel, about 16 or 17 miles, they will, after passing over some irregular soundings, of 14 to 9 and 12 fathoms, get into the meridian of Ostend, and at about 7 miles from the land, with Ostend bearing about S.S.W., and Blankenburg S.E. $\frac{1}{2}$ E.; but, as they may not be certain of their latitude within 2 or 3 miles, and as such an error might here, with a large ship, prove fatal, it will be more advisable to run into latitude $51^{\circ} 25'$, after passing the Clif Bank, until they get opposite to Ostend, where the banks are less dangerous. When ships from the northward are bound for Ostend or the Scheld, through West Deep, they should not

run to the southward of $51^{\circ} 22'$, until they have seen Ostend, Wenduin, or Blankenberg; nor attempt making the land to the westward of Wenduin.

If, before you reach the latitude of $51^{\circ} 22'$, you should perceive your water shoal, you may probably be getting on the banks at the entrance of the Scheld; in which case, steer westward, until you obtain sight of Ostend Town or lighthouse, the latter, as before observed, being visible 3 leagues from the land.

The new light at Blankenberg, and the red light at Heyst, will be of the greatest service to mariners approaching this part of the coast, as a single bearing of them will at once point out their situation.

FROM OSTEND TO ROTTERDAM.

Description of the Land, &c.

FROM Ostend to Blankenberg and Sluys, the coast is generally low, with small sand-hills; but about a mile to the eastward of Ostend there are some hummocks, more elevated than the rest, named the Spanish Sand Hills. Another hill always appears conspicuous, about midway between the Spanish Hills and Wenduin. Wenduin Church, with a square steeple, is nearly 7 miles E. $\frac{1}{2}$ N. from Ostend; and 2 miles beyond Wenduin is Blankenberg. From Ostend to Blankenberg, the land runs nearly E. $\frac{1}{2}$ N; it then turns a little more easterly, for 9 miles, or so far as the entrance to the Swin of Sluys. Blankenberg Church has a steeple, the shape of which is very common on these coasts, being covered with that kind of peaked roof, known among sailors by the term bluff, to distinguish it as well from the common square steeple as from the spire, and has two mills near it. In approaching this place, you generally perceive a number of boats hauled up on the sandy beach; and the steeples of Bruges appear conspicuously up the country. Between Blankenberg and Sluys, are several bluff-topped churches, and one with a spire-steeple. Sluys may be known by its grove of trees, and two remarkable bluff steeples. The channel leading to Sluys is called the Swin. Sluys is 3 miles up the Swin, and is a fortified place. On the opposite side of the Swin is Cassandria, situated on the western side of the island of Cadsand.

At Blankenberg is a small fixed light, elevated 30 feet, and is shown from sun-set to sun-rise.

At Heyst, a fixed red light has been established on the sand-hills, to the northward of the town, in latitude $51^{\circ} 20' 22''$ north, and longitude $3^{\circ} 14' 7''$ east of Greenwich. The lighthouse is 25 feet high; but the light is elevated 48 feet above the level of high-water, spring-tides, and will be visible from seaward between the bearings of east, round to W. by S., by compass.

CADSAND is a low island, nearly 12 miles long, and about 5 broad, having several churches and mills upon it. The Church of Groede is near the middle of the island, with a spire and telegraph on it. Toward the western part of the island is the Town of Cadsand. The shores of this island form the southern side of the entrance to the River Scheld.

PILOTS IN THE SCHELDT.—The Minister of Foreign Affairs gives notice to mariners, that from the 15th of August, 1842, there will be organised, at the mouths of the Scheldt, a Belgian pilot service, for vessels bound to Antwerp or Ghent, *viâ* the Terneuse Channel.

The distinguishing marks for the Belgian pilots are:—

1. The word "Antwerpen," surmounted by the letter "P," painted in black letters, of the height of 80 centimetres, on both sides of the sail; as also the number of the boat.
2. A red flag hoisted at the mast-head. The number of the boat will be sewed on to this flag, in white figures.
3. The words, "Bateau Pilote," and the number of the boat, painted on the stern.

The advantages which the vessels bound to Ghent and to Antwerp will derive from shipping a Belgian pilot, are:—

1. For vessels bound to Ghent.

A. To proceed direct from sea to Terneuzen, without change of a pilot.

B. To pay at Ghent, after arrival there, the inward sea pilotage.

C. To pay there also, prior to departure, the outward sea pilotage, and pilotage from Terneuzen to Flushing.

2. For vessels bound to Antwerp.

A. To pay on arrival at Antwerp the sea pilotage inwards, and the river pilotage from Flushing to Antwerp.

B. To pay at Antwerp, prior to departure, the sea pilotage outwards, as well as that from Antwerp to Flushing.

The Belgian pilots at the mouths of the Scheld, are all invested with a distinguishing medal, indicating their station, grade, and number.

They will be furnished with instructions for the use of masters of vessels, printed in the English, French, Dutch, Danish, German, Spanish, and Italian languages.

THE ISLAND OF WALCHEREN is to the northward of Cadsand, being about 10 miles long, and 8 miles broad. The land on the west part of this island is high in comparison, large sand-hills appearing, when viewed at a distance, in hummocks. That on the north-east side is not so high; but the whole coast is composed of white sand-hills. On the west part of the island, stands West Cappel, with a bluff steeple, and a short projection at its top. A light is now exhibited on this church, consisting of 32 lamps, with 8 reflectors, of 32 inches, which forms a conspicuous object, and may be seen on approaching the island, either from the northward or westward, at the distance of 5 leagues. A little to the westward of this church, is a windmill.

FLUSHING lies about 7 miles south-eastward from West Cappel, and $3\frac{1}{2}$ miles from Middleburgh. This is a well-fortified place, and may be known by its lofty spire-steeple and its Stadt-house, a large square building. Here are two excellent harbours, the entrances to which are formed by jetties, both dry at low water; but to the eastern one is annexed a basin, in which ships-of-war are laid up in ordinary. Between the islands of Cadsand and Walcheren, is the entrance to the Hondt, or West Scheld, the principal branch of which runs up to Antwerp. The breadth of the river, opposite Flushing, is at least $2\frac{1}{2}$ miles wide: but this river is rendered so very intricate by numerous *sand-banks*, that no mariner should attempt its navigation without engaging a pilot.

At Flushing is a fixed light, placed on a wooden eminence, on the west harbour bulwark. It is raised 49 feet above high water mark, is visible at a distance of 10 or 12 miles, and illuminates the horizon from E.S.E., through south, to N. by W. At Terneuse, on the opposite side of the river, 10 miles from Flushing, a fixed light has been established on the western harbour dyke, and is kept burning the whole night.

About $2\frac{1}{2}$ miles to the E.N.E. $\frac{1}{2}$ E. from West Cappel, is Domburgh, with a high spire-steeple; and to the eastward of Domburgh is East Cappel, with a small spire. The northern shore of Walcheren, from the Sconce Point, at the entrance of the Port of Camp Veer, or Ter Veer, has three signal-stations; besides a signal-post at West Cappel, one at Sconce Point, a second on the Downs, to the north-westward of Fort der Haak, and the third on a remarkable white sand-hill, near Domburg. Every part of the shore has a good beach, but commanded by the sand-hills, with many flake-jetties for the shelter of boats. Middleburgh steeple is high, and may generally be seen when coming in from sea, forming a conspicuous sea-mark, although it is situated considerably inland. The Chamber of Commerce have opened a canal from Middleburgh to Camp Veer, which lies on the north-eastern side of the island, through which vessels may now pass with facility. Storehouses have been erected on its banks, fitted for reception of all kinds of merchandise; and foreigners are allowed to deposit their goods, and export them again, free from all duties. A small lighthouse is erected on the southern side of the entrance of this canal, which serves sufficiently to point out its situation.

NORTH BEVELAND.—To the eastward of Walcheren lies North Beveland, being separated by a passage, called the Veer Gat, which is navigable all the way to

Flushing; but it is narrow, and much encumbered by *shoals*. North Beveland is about 8 miles long, and 3 miles broad. Its northern shore forms the southern boundary of the Eastern Scheld, while that of Schouwen encloses it to the northward. The river between them is full 4 miles broad.

SCHOUWEN lies to the north-eastward of Walcheren. Its northern and western parts have also many sand-hills on them, some of which are long and white, and called the Woolpacks; others appear in hummocks. The lighthouse at Schouwen is erected on the N.W. side of the island, and exhibits a revolving light, elevated 172 feet above high water mark. The light is visible 24 miles, and illuminates the horizon entirely; it appears 25 seconds in every $1\frac{1}{2}$ minute, and its greatest brilliancy lasts 10 seconds. The tower is in latitude $51^{\circ} 37' 55''$ north, and longitude $3^{\circ} 41' 45''$ east of Greenwich.

Zierickzee Church, which stands on the southern part of this island, appears somewhat like St. Paul's, in London. There is a fixed light placed on a house, situated on the west pier of Zierickzee Harbour. It is raised 42 feet above high water mark, and visible at a distance of 5 miles, and illuminates the East Scheld and Zierickzee Roads. Brouwershaven lies on the northern side of the island of Schouwen; and the channel formed between the islands of Schouwen and Goeree, is commonly called Brouwershaven Gat, or Passage. The navigation is very much impeded by numerous *shoals*, and requires a pilot: it leads to Willemstad, &c.

GOEREE ISLAND lies to the north-eastward of Schouwen, and appears, when viewed at a distance, in white hummocks, those at the west end being the highest. Near the northern shores of this island stands Goedereede, or Goeree Church, with a square steeple, being one of the principal marks for entering the West Gat. It shows a light at night. This light is fixed, and placed 147 $\frac{1}{2}$ feet above high water mark; is visible at the distance of 6 leagues, and illuminates the horizon from S.W., round to the northward, and to S.E. Nearly 2 miles to the westward of the Church, a tall spire, of brick, called the Steen Baak, or Stone Beacon, has been constructed for another mark; and still farther west, a large beacon, of pyramidal form, called the Houten Kaap, which also carries a light at night. This light is fixed, and stands in latitude $51^{\circ} 49' 30''$ north, and longitude $3^{\circ} 53' 46''$ east; is 72 feet above high water mark, and visible at the distance of 10 or 12 miles, and illuminates the horizon from east, round by north, to W.S.W. To the southward of them is the Church of Ouddorp, with a spire.

VOORN ISLAND lies to the north-eastward of Goeree, and appears fronted with small sand-hills. On the north-western point of the island, 2 miles eastward of the Pest-house, stands the Maas lighthouse, exhibiting a common light, composed of two argand lamps (fixed), and two parabolic reflectors: one lamp in line with the channel over the Briel bar, and bearing N. by W.; the second in line with the new channel, called Spleet, and bearing N.W. by W. This light is placed on an eminence on the downs, near Oostvoorn, 41 feet above high water mark, and visible about 3 miles.

On the south side of Voorn Island, stands the town of Hellevoet Sluys. A fixed light is placed on a tower, built for the purpose, on the west pier of Hellevoet Harbour: it is placed 46 feet above high water mark, and visible 8 miles, from S.E., through south, to N.W. A canal has been constructed through the island of Voorn to the Maas. This was opened November 8th, 1830, and promises to be of infinite service to Rotterdam, as a vessel can now get to sea from the Maas, by passing through this canal, at any time. It is now generally adopted by vessels drawing 16 $\frac{1}{2}$ feet water, instead of the old, intricate, and circuitous passage. Vessels going from Hellevoet Sluys to the Maas, near Rotterdam, will only take 4 hours. Hellevoet Sluys is a fortified town, with a pier.

The channel between Voorn and Goeree is about 3 miles wide, and encumbered with the *Hinder* and other *sand-banks*, over which there are two navigable channels. That to the southward runs along to the side of the island Goeree, and is called the West Gat; that to the northward is named the North Gat. Both are well buoyed; but this navigation requires the assistance of a pilot.

The northern part of Voorn Island forms the south side of the entrance to the River Maas, leading to Rotterdam. Near the N.E. part of the island is the Briel Church, remarkable for its large square steeple, on the top of which is a light, as also one on [NORTH SEA.]

the pier; but this light only burns on moonless nights. At $1\frac{1}{2}$ mile to the northward of the island of Voorn, is the Hook of Holland; within which, inland, is Gravesand. The River Maas contains many *sandy flats*, which must impede its navigation, and render a pilot always necessary.

DESCRIPTION OF THE BANKS AND CHANNELS BETWEEN OSTEND AND THE HOEK, OR HOOK OF HOLLAND.

The WEST HINDER, although not very shoal, is dangerous, from its great distance off the land, and from its being directly in the way of vessels from the westward, bound for the Scheld. It is a long narrow *bank*, lying in the direction of N.E. $\frac{1}{2}$ E., about 13 miles in length. Its southern end, in 5 fathoms, lies N.W. by N., distant about 4 miles from the N.E. end of the Clif Bank, or Eastern Dyck, being in latitude $51^{\circ} 23'$ north; and its northern end in latitude $51^{\circ} 34'$ north. The depths on the bank are very irregular—from $4\frac{1}{2}$ to 3 fathoms, shoaling from 15 to 9 fathoms very suddenly, the latter depth being close to the edge of the bank.

The south end of this bank bears from the North Foreland lighthouse E.S.E., distant 36 miles; from the Galloper light-vessel S.S.E. $\frac{1}{2}$ S., 29 miles; from Ostend N.W. $\frac{1}{2}$ N., 20 miles; and from West Kapelle W. $\frac{1}{2}$ N., 39 miles. The north end bears from the Galloper light-vessel S.E. $\frac{1}{2}$ S., 26 miles; from Ostend N. by W., 24 miles; and from West Kapelle W.N.W. $\frac{1}{2}$ N., 32 miles.

In the day-time, this bank may be generally discovered by the rippling of the tide over it; but it is advisable to keep the lead going, when approaching this or any other of the banks on the Flemish coast, when in a depth of less than 20 fathoms, for you will find 14 and 12 fathoms close to the bank; and the shoal part, with knolls of 3 fathoms, extends full 10 miles along the centre of the bank, and should at all times be approached with great caution.

FAIRY BANK.—Three miles to the westward of the south end of the West Hinder, lies the *Fairy Bank*, extending N.E. $\frac{1}{2}$ E., about 8 miles, and from $\frac{1}{2}$ to $\frac{3}{4}$ of a mile broad, with from 4 to 9 fathoms on it. Its shallow part, with $4\frac{1}{2}$ fathoms on it, is 2 miles in length, and nearly in the centre of the bank, and lies between latitude $53^{\circ} 23'$ and $53^{\circ} 25'$ north; and 32 miles from the North Foreland, in the channel between this bank and the West Hinder, are 14 to 19 fathoms, except near its north end. In mid-channel there is a narrow *shoal*, of 9 fathoms, about 2 miles in length, running parallel with the banks, having 16 to 19 fathoms close to it.

About a mile to the westward of the Fairy Bank is another *bank*, running parallel with it, 4 miles in length, with from $6\frac{1}{2}$ to 9 fathoms on it. There are some *patches* of 9 and 10 fathoms off its S.W. end, and also one of the same depth near its N.E. end; and there are some 10-fathom *knolls*, full 2 miles to the westward of this bank, having from 15 to 20 fathoms close to them. When in the parallel of the North Foreland, these are the first shoals you will meet with after passing the Falls, when bound to the eastward. By sounding on them, you will be warned of your approach to the West Hinder.

NORTH HINDER.—The south part of this bank bears N. by E., distant 2 miles from the north end of the West Hinder, having in the channel between them from 12 to 19 fathoms. It thence extends N.E. by N., 6 miles, to latitude $51^{\circ} 42'$ north, having from $4\frac{1}{2}$ to 5 fathoms on its shoalest parts, which runs about 2 miles along the centre of the bank; from this to the extremes of the bank, are $6\frac{1}{2}$ to 8 fathoms.

EAST HINDER.—The south end of this bank commences in latitude $51^{\circ} 30'$ north, and lies $1\frac{1}{2}$ mile to the eastward of the north end of the West Hinder, having 12 to 20 fathoms in the channel between them. This bank is about 11 miles in length, and $\frac{1}{2}$ of a mile in breadth, with a narrow *ridge*, of 4 fathoms, running nearly the whole length of the bank. Its north end lies in latitude $51^{\circ} 40'$ north. Between this bank and the North Hinder, are 14 to 21 fathoms; and the channel is 3 miles wide.

BLIGH BANK lies about $2\frac{1}{2}$ miles to the eastward of the East Hinder, and runs in a N.E. direction, 10 miles, and is from $\frac{1}{2}$ to $\frac{3}{4}$ of a mile broad, with from 5 to 9 and 10 fathoms on it. Its north end lies in latitude $51^{\circ} 42'$ north, and longitude $2^{\circ} 48'$ east. The spot with 5 fathoms upon it, is only a mile in length, and $\frac{1}{4}$ of a mile in width; the centre of it lies in latitude $51^{\circ} 35'$ north, and in the meridian of Nieuport. There is a small *patch*, of $5\frac{1}{2}$ fathoms, at each end of this bank. On all other parts of it there is sufficient water for the largest ships. Between the Bligh and the East Hinder, are from 18 to 21 fathoms, sand and shells.

Between the Bligh and Thornton's Ridge is a *bank*, about 3 miles in length, running in an east and west direction, with from $8\frac{1}{2}$ to $9\frac{1}{2}$ fathoms on it. Close to this, on the south side, are 18 and 19 fathoms; and along its north side 15 fathoms. About 2 miles E.N.E. of this, is another narrow *bank*, about 3 miles in length, with $8\frac{1}{2}$ to $9\frac{1}{2}$ fathoms on it, and from 15 to 18 close to it.

THORNTON'S RIDGE extends in an E.N.E. $\frac{1}{2}$ E. and W.S.W. $\frac{1}{2}$ W. direction, and is about 10 miles in length, and $1\frac{1}{2}$ mile in breadth in its broadest part. Its N.E. part lies about $2\frac{1}{2}$ miles to the westward of the Rabs, between which are from 9 to 17 fathoms. The shoal part of this bank is narrow, and about 3 miles in length. This part has only from 2 to 5 fathoms upon it, and is dangerous. On all other parts of this bank there are from 6 to 9 fathoms. When on the shoalest part of Thornton's Ridge, Bruges steeples show nearly midway between Blankenberg and Leiswegan, the latter place bearing S. $\frac{1}{4}$ E., and West Kapelle S.E. by E. $\frac{1}{4}$ E., about 17 miles distant. Bruges steeples between Blankenberg and Leiswegan, rather nearer to the latter, bearing S. $\frac{1}{4}$ W., carries you to the eastward of the Ridge. Bruges steeples, open to the westward of Blankenberg, bearing S. $\frac{3}{4}$ E., will take you clear to the westward of it: and Middelburg steeple just open to the southward of West Kapelle, bearing S.E. $\frac{3}{4}$ E., will clear it to the northward; but the land is so low and so distant, that these marks will seldom be available from the deck of a small vessel.

The RABS are some irregular *ridges of rough ground*, lying directly in the way of vessels from sea, bound to the River Scheld, through the Duerloo Channel. They are about $1\frac{1}{2}$ mile in breadth, and the shallowest part, in latitude $51^{\circ} 35'$ north, has 4 fathoms on it. The outermost, or western part of them, bear from West Kapelle N.W. $\frac{1}{4}$ W., distant 13 miles; and from Thornton's Ridge N.E. by E., distant nearly 3 miles, extending N.E. and S.W. The soundings are uncommonly irregular, suddenly changing from 4 to 8 fathoms, being unlike any other soundings hereabout. West Kapelle steeple on with Middelburg, bearing S.E. $\frac{1}{4}$ E., leads on the middle of the shoal. Bruges steeples will then be just open to the eastward of Leiswegan, bearing S. by W. $\frac{1}{4}$ W.; but this is so long a mark, that it will be seen only in very clear weather. The rippling of the tide and the lead will, however, commonly point them out with sufficient certainty.

To clear the Rabs on the north side, bring Middelburg steeple to bear S.E. This bearing will take you across the west end of the Middle and Steen Banks, in 7 or 8 fathoms.

Between the Rabs and the Raen Sand, at the entrance of the River Scheld, is a large space, called the West Pit, about 6 miles in length. The depths in the pit are from 12 to 16 fathoms, shoaling gradually towards the Raen, but deepening towards Thornton's Ridge, close to which are 17 fathoms, with good holding ground.

The SCHAR lies N.N.E., 2 miles from the north end of the Rabs. This is a narrow *bank*, with from 7 to 9 fathoms on it, extending E.N.E. and W.S.W., about 3 miles: between it and the Rabs are from 18 to 20 fathoms.

The STONE BANKS are *two ridges*, divided into the *North* and *South Stone Banks*, lying nearly in the direction of E.N.E. $\frac{1}{2}$ E. and W.S.W. $\frac{1}{2}$ W., to the extent of $8\frac{1}{2}$ miles. This is the extent of the shoal part of the bank; but it continues to run about $1\frac{1}{2}$ mile farther from each end of these shoals, with from 6 to 8 fathoms on it. The N.E. extremity of the North Stone lies with Middelburg steeple just open to the eastward of East Kapelle, distant from the latter $8\frac{1}{2}$ miles, bearing S. $\frac{3}{4}$ E.; and West Kapelle Church S.S.W., distant nearly 10 miles. At the S.W. end, West Kapelle bears S.E. by S. $\frac{1}{4}$ S., distant 8 miles, and East Kapelle S.E. $\frac{3}{4}$ E., distant $10\frac{1}{2}$ miles. The South Stone Bank is not at any part above $\frac{1}{2}$ a mile wide, its length being about 2 miles, with 3, 4, and 5 fathoms upon it. The northern end of the South Stone Bank is distant

nearly 2 miles from the southern end of the North Stone Bank, on which there are only 2 fathoms on its shoalest part. Between them are from $5\frac{1}{2}$ to $7\frac{1}{2}$ fathoms, through which the largest ships may pass, the leading-mark being Middelburg steeple, very little to the southward of Domburg steeple, bearing S.S.E. $\frac{1}{2}$ E.

The South Stone Bank is a very narrow circular *ridge*, 2 miles long. Its northern end lies N. by W. $\frac{1}{2}$ W. from West Kapelle, distant $7\frac{1}{2}$ miles, and its southern end N.N.W. $\frac{1}{2}$ W., distant $8\frac{1}{2}$ miles. Over this bank are $3\frac{1}{2}$ and 4 fathoms. The windmill which stands to the westward of West Kapelle, just touching the eastern part of the sand-hill, which forms the west face of the island of Walcheren, then appearing in one, bearing S.S.E. $\frac{1}{2}$ E., will carry you clear to the southward of this shoal, in 7 fathoms water.

Walcheren Road, or Stone Deep, is formed by the Stone Banks to the north-westward, and the Rassen, Kuerens, and Banjaard Banks to the south-eastward. It is about 2 miles in width, and 7 miles in length, in an E.N.E. $\frac{1}{2}$ E. direction, and has from 6 to 13 fathoms water in it, shoaling gradually towards the in-shore bank, the ground being clay, and holding well. The marks for the best anchorage, in about 7 fathoms, are West Kapelle bearing S. by W.; and Middelburg steeple on with the west end of the wood, between Domburg and East Kapelle, bearing about S. by E. $\frac{1}{2}$ E.

THE MIDDLE BANK lies $1\frac{1}{2}$ mile northward of the Steen Bank, and runs parallel with it. In the channel are from 11 to 18 fathoms. This bank lies E. by N. $\frac{1}{2}$ N. and W. by S. $\frac{1}{2}$ S., and is nearly 13 miles in length, from 9 fathoms at each end, and about $\frac{3}{4}$ of a mile in breadth; except near its west end, where it is about $1\frac{1}{4}$ mile broad. The shoalest parts of this bank lie near its extremities, and have from $3\frac{1}{2}$ to 5 fathoms on them. Between them the bank may be crossed, in from 6 to 7 fathoms, without danger, a distance of 7 miles. The western shoal is $\frac{3}{4}$ of a mile in length: its centre, in 4 fathoms, bears from West Kapelle N.N.W. $\frac{1}{2}$ W., $10\frac{1}{2}$ miles. The northern end of the shoal water, on the north part of the bank, bears from West Kapelle N.N.E., distant 13 miles; from thence it extends 2 miles W. by S. $\frac{1}{2}$ S., with from $3\frac{1}{2}$ to 5 fathoms on it.

SCHOUWEN BANK is narrow, and lies northward of the east end of the Middle Bank, and runs parallel with it. The channel between them is $1\frac{1}{2}$ mile broad, with from 12 to 19 fathoms in it. This bank extends E. by N. $\frac{1}{2}$ N. and W. by S. $\frac{1}{2}$ S., 12 miles, and is about $\frac{1}{2}$ a mile broad, with from 4 to $8\frac{1}{2}$ fathoms on it. Its N.E. end lies in latitude $51^{\circ} 50'$ north, and longitude $3^{\circ} 31'$ east. The shoalest part of this bank is a narrow *ridge*, near its centre, about $2\frac{1}{2}$ miles in length, with 4 and $4\frac{1}{2}$ fathoms on it. Its eastern end bears from West Kapelle N.N.E., 16 miles; and its western end N. by E., 14 miles. There is also a small *patch*, with $4\frac{1}{2}$ fathoms on it, near the west end of the bank, lying N. $\frac{1}{4}$ W., 13 miles from West Kapelle. On the other parts of the bank are from 6 to $8\frac{1}{2}$ fathoms.

Having described all the outer banks, we shall now proceed to the inner banks, being those at the entrances to the River Scheld, &c.

THE LEISWEGAN, or SCHOONEVELDE BANK, is a part of an extensive *shoal*, commonly known by the name of the *Raen*. It is a mile long, and $\frac{1}{2}$ a mile broad, having from 2 fathoms water over it. The western end of this shoal lies N.E. by N. from Blankenberg, distant 7 miles; and from Ostend N.E. by E. $\frac{1}{2}$ E., distant 15 miles. Its eastern part lies N.E. from Blankenberg, distant 8 miles, where it is divided from the *Raen* by a *flat*, of 4 and $3\frac{1}{2}$ fathoms water. The direct course through this passage is, with the steeple of Cassandra S.S.E.; but it should never be attempted without a thorough knowledge of your situation, or the assistance of a pilot.

THE RAEN is an extensive and *dangerous bank*, on which are several patches of very shallow water. Its eastern part forms the western boundary of the Deurloo Channel; its southern part, the northern limit of the Spleet Channel. Its western side is divided from the Schoonevelde Bank, by the flat already mentioned; and its northern extremity is pointed out by a red buoy; the length of the *Raen*, north and south, being about 6 miles. Upon this bank are from $2\frac{1}{2}$ to 5 feet at low water, with regular soundings as you approach it from the northward, gradually shoaling to the edge of the sand; the lead will, therefore, always prove a sure indication of your approximation to it.

THE INNER, or RIB BANK, is a long narrow *shoal*, extending from the meridian of Blankenberg in an E. $\frac{3}{4}$ S. direction, to abreast of the Elboog, its eastern end being called Staart, which dries at low water; and to the westward of this part, are several *patches* of dangerous and shallow water, with 3 to 4 fathoms between them.

This bank lies to the southward of the Schoonevelde and Raen, and divides the Wielinge from the Spleet Channel. This latter passage is about $\frac{3}{4}$ of a mile wide, and has from 4 to $5\frac{1}{2}$ fathoms within it. Towards the Elboog it becomes narrower, and somewhat more intricate, shallowing to $2\frac{1}{2}$ fathoms. The marks for sailing through the Spleet Channel are Middelburg steeple on with West Kaapduinen, bearing nearly E. $\frac{1}{4}$ S.

There are 4 black buoys lying on the inner edge of the Rib Bank, and one to the westward, called the Fairway buoy, to direct vessels through the Wielinge Channel.

The Outer, or Fairway buoy, lies in $4\frac{1}{2}$ fathoms water, with Bruges steeples on with a conspicuous sand-hill, about $\frac{1}{2}$ a mile to the eastward of Blankenberg, called Lucifer's Duin, bearing S. $\frac{1}{4}$ E.

The buoy marked "No. IV.," lies on the S.W. end of the Rib, in $4\frac{1}{2}$ fathoms, $2\frac{1}{2}$ miles E. by S. from the Outer buoy, with the steeple of Leiswegan between those of Bruges.

The buoy "No. III.," lies $1\frac{1}{2}$ mile E.S.E. $\frac{1}{4}$ E. from No. IV., in $4\frac{1}{2}$ fathoms, on the south side of the Bol of Heist, with Bruges steeples over the sandy-hill called Slakerduin, bearing S. by W. $\frac{1}{2}$ W.

The buoy "No. II.," lies E. $\frac{1}{2}$ S., $2\frac{1}{2}$ miles from No. III., in about 5 fathoms, on the south side of the Bol of Knoke, with Bruges steeples a little to the eastward of the Gaanpad, bearing S.S.W. $\frac{3}{4}$ W. To the S.E. of this buoy are 6 to $6\frac{1}{2}$ fathoms. When this depth decreases to the southward, it is a sure sign that you are approaching the Paarde, which will be a guide in the night; and in the day-time, Blankenberg may be seen to the southward of Lucifer's Duin.

"No. I." buoy lies about 4 miles E. by S. $\frac{1}{4}$ S. from No. II., with Cassandria Church bearing S. $\frac{1}{4}$ E.

THE ELBOOG is a hard narrow sand, drying at low water. That part of its southern end which dries, lies W. by N. from the pier of Flushing, distant $1\frac{1}{2}$ mile. From this flat it extends to the north-westward, rather more than 3 miles. From thence a bank of shallow water, passable only by small vessels, connects it to the Raen. The northern side of the Elboog forms the south boundary of the Deurloo Channel.

THE PAARDE is a narrow shoal, of from $2\frac{1}{2}$ to $3\frac{1}{2}$ fathoms, lying in the Wielinge Gat. It is $1\frac{1}{2}$ mile in length, with from 5 to 7 fathoms in the channels on each side of it. There is a white buoy near each end. The western buoy lies in $4\frac{1}{2}$ fathoms, about a mile S.S.E. $\frac{1}{4}$ E. from the black buoy, No. II., on the Rib; and the eastern buoy at the extremity of the bank E.S.E. $\frac{1}{4}$ E., 2 miles from the former, in about $4\frac{1}{2}$ fathoms. The marks for the western buoy are Leiswegan steeple, a little to the eastward of Heist Mill, bearing S.W. $\frac{3}{4}$ W. The eastern buoy lies with Bruges steeples bearing S.W., and Groede steeple on the Old Zwarte Battery, S.E. by E. About $\frac{3}{4}$ of a mile to the southward of the west end of this bank, is a knoll, of 6 to 9 feet only; in the channel between them, are $5\frac{1}{2}$ fathoms.

WIELINGE.—Between the Paarde and the Inner or Rib Bank, is an excellent channel, called the French Pass or Wielinge, leading to the Scheld. It is, in most parts, $1\frac{1}{4}$ mile wide, and has regular soundings of 4, 5, 6, and 7 fathoms in it. The Paarde gradually shoals as you near it; and, on the edge of the Rib Bank, are 5, 4, and $3\frac{1}{2}$ fathoms. Flushing Cathedral bearing E. $\frac{3}{4}$ S., will lead you clear through it from abreast of the Wendune Bank to the Sluys, passing the black buoys of the Rib on the port or larboard, and the white buoys on the starboard hand.

CADSAND BANK lies in the channel, at the entrance to the West Scheld, with a white buoy upon its western point, which lies E. by S., nearly $2\frac{1}{2}$ miles from the eastern buoy of the Paarde, in about 4 fathoms. Its marks are, the Orange Mill in Flushing, open to the southward of the harbour lighthouse, east, a little southerly. The Cadsand is a narrow shoal, about 2 miles long, in the middle part of which are only 18 feet; near each end are 4 fathoms. To the northward of Cadsand Bank, near the edge of the Inner or Rib Bank, is the *Hompel Knoll*, a narrow spit of sand, with only 6 feet on it; and has a passage between it and the Staart, of 7, 6, $3\frac{1}{2}$, and 3 fathoms. There are 3 black buoys on the south side of the Hompel, lying in an E. by S. direction, about a mile apart. Between the Hompel and the Cadsand Bank, are 5, 6, and 7 fathoms. Between the Cadsand Bank and the shore, the water is still deeper, but the channel is not above $\frac{1}{2}$ a mile wide. The whole of this part, from the Wendune Bank to the Swin of Sluys, is generally known by the name of the Blanke-

berg Flats. The Swin runs in circularly to Sluys: there is a buoy on the eastern side of the channel, and some beacons on the western side. The town of Cassandria is about 2 miles within the buoy.

From Ostend to the Swin, a shallow *sand* runs along the shore, having 3, 4, and 5 fathoms all the way. This channel is commonly used by the coasting vessels.

The RASSEN is a large *sand-bank*, which lies to the north-eastward of the Raen, and stretches along in the direction of the western shore of Walcheren. Its western part forms the port or larboard or eastern side of the Deurloo Channel, which, in times of peace, is commonly buoyed. The Rassen has many *patches* of very shoal water upon it; between which are swashways, or passages for small vessels drawing little water; but upon some parts of them the sea breaks. It shoals gradually, and may be approached by the lead, both on the north and west sides. The south side is more steep. Its western edge is hard sand. The southern point of the Rassen lies N.W. by N. from the beacon of Flushing, distant 5 miles, and thence extends N. by W., nearly $6\frac{1}{2}$ miles, becoming, at its northern part, full 4 miles broad. At its south-eastern extremity, in $1\frac{1}{2}$ fathom water, West Kapelle Church bears N. by E., distant nearly 8 miles.

The ZOUTELAND BANK is a long narrow *ridge*, which stretches off the S.E. part of the Rassen, and runs parallel to the shore, from which it is not $\frac{1}{2}$ a mile distant. Near its S.E. end is a red buoy, in about $3\frac{1}{2}$ fathoms water, at nearly $\frac{1}{2}$ of a mile off shore, with Middelburg steeple on the westernmost Kaapduinen, bearing E. 2° S. Nearly opposite Zaalduin, on its inner edge, is a white buoy, called the 70 Roeden buoy.

The DEURLOO CHANNEL is bounded by the Raen and Elboog to the south-westward, and the Rassen to the north-eastward. In time of peace, this channel is regularly buoyed; but during war, the buoys are generally taken up.

In mid-channel, before the entrance of the Deurloo Channel, is the fairway buoy. It is red, and lies in $4\frac{1}{2}$ fathoms, at the distance of $7\frac{1}{2}$ miles N.W. by W. $\frac{3}{4}$ W. from West Kapelle Church. Its marks are, Bruges and Heist steeples in one, S.S.W., westerly; East Kapelle, a little to the southward of Domburg, E. by S.; and Middelburg steeple on the middle of Zaalduin, S.E. by E. $\frac{1}{2}$ E.

The Deurloo Channel is pointed out by six white buoys on the south side, and five black buoys on the north side, marked "D" (for Deurloo), and numbered from the inner ones outward.

The four black buoys, Nos. V., IV., III., and II., lie nearly in a S.E. $\frac{1}{2}$ S. direction from the red, or fairway buoy; the first, or No. V. (on the bar), at the distance of $1\frac{1}{2}$ mile, in $3\frac{1}{2}$ fathoms; No. IV., in $3\frac{1}{2}$ fathoms, nearly a mile from No. V. From No. IV. to No. III., the distance is $1\frac{1}{2}$ mile, in $3\frac{1}{2}$ fathoms, with West Kapelle steeple and mill in one, and Middelburg steeple close to the northward of Zouteland steeple. From No. III. to No. II., the distance is 2 miles; and from thence to No. I., S.E. $\frac{3}{4}$ E., 2 miles, in 4 fathoms, with West Kapelle on Zaalduin, N. by E. $\frac{1}{2}$ E. Two miles from this buoy, lies a red buoy, on the south point of the Zouteland Bank.

The outer white buoy, No. VI., lies in $3\frac{1}{2}$ fathoms, $1\frac{1}{2}$ mile S. by W. $\frac{1}{4}$ W. from the red buoy, and W.S.W. $\frac{3}{4}$ W., $1\frac{1}{2}$ mile from the outer black buoy, No. V., with Bruges steeples open to the eastward of Heist Hill, and Middelburg steeple close to the northward of Zouteland steeple. The next white buoy, No. V., lies in 4 fathoms S.E. $\frac{1}{2}$ E., 2 miles from the white buoy, No. VI., and S. by E. $\frac{3}{4}$ E., $3\frac{1}{2}$ miles from the red buoy, with West Kapelle steeple, the mill, and the black buoy, No. III., in a line, from which it is distant $1\frac{1}{2}$ mile. The white buoy, No. IV., lies in 3 fathoms, $2\frac{1}{2}$ miles S.E. $\frac{1}{2}$ S. from the white buoy, No. V., and a mile W.S.W. $\frac{1}{2}$ W. from the black buoy, No. II., with Domburg and West Kapelle steeples in one. The white buoy, No. III., in $3\frac{1}{2}$ fathoms, is $1\frac{1}{2}$ mile S.E. $\frac{1}{2}$ E. from No. IV., with Flushing steeple S.E. $\frac{3}{4}$ E. The white buoy, No. II., is 2 miles S.E. $\frac{1}{2}$ E. from No. III.; it lies in 3 fathoms, near the edge of the Elboog, with Middelburg steeple on the Middle Kaapduin. The white buoy, No. I., called the Elboog buoy, lies close to the north side of that part of the sand that dries, and nearly 2 miles S.E. by E. from No. II., with Middelburg steeple on the Galgeschaar, and Flushing steeple bearing S.E. $\frac{3}{4}$ E., distant $2\frac{1}{2}$ miles, nearly.

The Deurloo is the most difficult to enter of all the channels into the Scheld, and large vessels must not attempt crossing the Drempel nor bar until half-flood, waiting outside, with Middelburg anywhere on West Kapelle Dyke.

The CALOO BANK begins about $\frac{1}{2}$ of a mile from the north-end of the Rassen. Its N.W. point lies N.W. by N., $4\frac{1}{2}$ miles from West Kapelle Mill; N.W. by W. $\frac{3}{4}$ W., 6 miles from Domburg Church; and E. by N. from the red buoy of the Dourloo Channel, its eastern edge forming the west side of the entrance to the East Gat. From the north-eastern part, East Kapelle steeple appears on the east end of Oosteroog, S.E. by E. $\frac{1}{4}$ E.; and Groede steeple, in Cadsand, on with the eastern part of the wood of Wulpen, bearing nearly S. $\frac{1}{4}$ W.

The KUERENS (sometimes called the Domburg Shoal,) form an extensive and dangerous bank, of irregular soundings, of from 1 to 3 fathoms. This bank separates the East Gat from the Room Pot, its northern extremity being about $5\frac{1}{2}$ miles N. by E. from West Kapelle Church.

The EAST GAT lies between the two last-mentioned banks. It is the easiest channel to sail through without a pilot, especially with northerly winds. The marks may generally be seen very distinctly; and the course in is from S. $\frac{1}{4}$ W. or S. by W., until doubling the point of West Kapelle, when it changes to S.S.E. $\frac{1}{4}$ E., between Zouteland Bank and the shore of Walcheren, this part being called the Zouteland channel. To avoid the north side of the Caloo, East Kapelle must not be brought so far southward as the south side of Oosteroog; and to clear the Kuerens, Middelburg steeple must not be brought to the eastward of the Graan. At the entrance, in $3\frac{1}{2}$ fathoms water, there is a red buoy, placed to point out the best channel; but this buoy is frequently driven away in stormy weather. Its marks are, Middelburg steeple, on the west part of a sand-hill, called Roggenbrood; and West Kapelle steeple, a ship's length to the westward of Kaaphuis.

Groede steeple, just open of the Point of West Kapelle, is a good mark to enter the East Gat, in clear weather, until within a mile of that point, when those marks must be opened to give the point a berth. When Domburg steeple approaches East Kapelle, the water deepens to 5 or 6 fathoms; and off West Kapelle, to 9 or 10. After passing that part, the channel becomes narrow, in some parts not exceeding $\frac{1}{2}$ of a mile; but the depths increase from 10 to 12 fathoms, both sides being steep-to.

The BANJAARD is an extensive flat, lying off the mouth of the Eastern Scheld, and to the westward of the west end of the island of Schouwen. Parts dry at low water; but there are several swashways through it, as well as a channel, of 3 and $3\frac{1}{2}$ fathoms, between it and Schouwen. The Banjaard is also separated, nearly in the middle, by a channel, called the Middle or West Gat, within which runs the passage to the southward of West Schouwen; and to the northward of Neeltje Jans and Rug Plaat, called the Hammon Channel. The south-western part of the Banjaard is a triangular sand, $5\frac{1}{2}$ miles in length, the western point of which stretches towards the Room Pot, and has a buoy upon it, in $1\frac{1}{2}$ fathom water. The northern prong extends to the Middle Gat, and has 2 fathoms over its extremity; while that part of the sand which lines the side of the Middle Gat, becomes dry at low water, and is called the Noord Land. The north-eastern part of the Banjaard is about a mile distant from the Noord Land, and extends $4\frac{1}{2}$ miles E.N.E., or so far as the entrance of Brouwershaven, running out to seaward full 6 miles. On the southern part of the Northern Banjaard, is a large patch, called *Zee Hond Plaat*, which dries at low water. This forms the north-eastern boundary of the Middle Gat. The *Zee Hond Plaat* is full $1\frac{1}{2}$ mile broad, and $2\frac{1}{2}$ miles long. To the eastward of the *Zee Hond Plaat* is a narrow crooked part of a bank, called the *Krabbe Plaat*, which also dries, and has a channel between, of 4 and 5 fathoms; but, as you advance to the northward, this passage becomes shallow, and too intricate for navigation without a pilot. The *New Sand* is also a part of the Banjaard, and lies at its northern extremity, and forms the south side of Brouwershaven Gat or Pass. There are several other parts of this bank which dry; and the whole abounds with shallows and dangers. The passage between it and the Schouwen shore, called the *Krabben Gat*, is narrow and hazardous, and fit only for those well acquainted with it.

In coming from the northward, to enter the Eastern Scheld by the Room Pot, care must be taken to avoid the west and S.W. ends of the Banjaard. The former, in $3\frac{1}{2}$ fathoms, lies with Middelburg steeple half its apparent height to the eastward of East Kapelle steeple; and West Kapelle steeple in one with the first sand-hill to the N.W. of the flat-topped sand-hill Zaalduin. West Kapelle steeple, kept on any part of the said flat-topped hill, will lead clear to the westward of the Banjaard. The S.W. part of the Banjaard, on which there are not more than 2 fathoms, although within it

there are 3 fathoms, lies with Middelburg and East Kapelle steeples in one. The mark to clear it is Middelburg on with the wood, seen over the Duins, between East Kapelle and Domburg.

The south side of the Banjaard has three black buoys along its edge. The outer buoy lies in about $4\frac{1}{2}$ fathoms, $1\frac{1}{2}$ mile from the shore, with East Kapelle steeple bearing about S. $\frac{1}{2}$ W. The second and third buoys lie in an E. by S. direction from it. The second, $2\frac{1}{2}$ miles from the outer buoy; and the third about $4\frac{1}{2}$ miles from it.

About mid-way, between the two last-mentioned buoys, and on the opposite side of the channel, is a red buoy, on the western extremity of the *Onrust*, a large *bank*, projecting $2\frac{1}{2}$ miles from the west end of North Beveland, separating the Room Pot from the Veer Gat. This buoy is rather more than $\frac{1}{2}$ of a mile from the Walcheren shore. The Veer Gat is marked out by five black buoys on the east side, and by two white buoys and three beacons on the west side.

There are also several buoys, pointing out the proper channels of the Eastern Scheld; the black buoys being always passed on the port or larboard side, and the white ones on the starboard.

The OOSTER, or EAST BANK.—The western part of this bank lies to the E.N.-eastward of the northern part of the Banjaard, from which it is distant a mile, with $2\frac{1}{2}$ fathoms upon its outer end, where there is a black buoy. This lies N.W. by W. from Renesse Church, distant $6\frac{1}{2}$ miles; and N. by W. $\frac{1}{2}$ W. from West Schouwen, distant $6\frac{1}{2}$ miles. From thence a narrow and shallow *ridge*, with from 12 to 6 feet over it, runs E.S.E. $\frac{1}{2}$ E., 5 miles. The south end of the bank runs irregularly E.S.E. $\frac{1}{2}$ S., 4 miles, or till the Boomen (trees) of Beukelaar bears S. $\frac{3}{4}$ E., distant $\frac{3}{4}$ of a mile. Along this edge are 12 to 18 feet. These form the north side of the entrance of Brouwershaven Gat or Channel. On the south side of the Ooster Bank is a large shallow *flat*, called the *Middle Plaats*, with not more than 6 feet on it, and part of its east end dries. To the northward of the Middle Plaats are several shallow *patches*, of 5 or 6 feet water.

Brouwershaven Gat has been lately buoyed off, and forms now one of the safest ports on this part of the coast, from its extent and depth of water, as described hereafter.

The northern part of the Ooster Bank sweeps round to the West Gat of Goeree, and its southern side is bounded by the Kous Channel. The shoalest part of the bank lies towards its northern edge, some patches of which dry at half-ebb. At 7 miles distance from the downs of Goeree, there are from 5 to 10 feet water, and farther westward, from 15 to 18 feet; but near the western end of the Ooster is a small *patch*, which is awash at low water. Along the north side of the Ooster Bank the ground is soft, and the soundings irregular in many parts, so that it will be dangerous to approach it in the night.

The Springer encircles the west end of the Goeree Island, and forms the N.W. side of Springer's Deep. It is very shallow, and dries at low water.

Between the Banjaard and Ooster Banks, is the main channel to Brouwershaven, at the entrance to which are 7, 6, $5\frac{1}{2}$, and 5 fathoms water. The passage is about a mile broad, and the course in E.S.E. On the port or larboard side are numerous *shoals*; and the intricacies of the navigation always will require a pilot. The mark for entering this channel, between the black and white buoys, is Renesse steeple a handspike's length south of the new-erected mark, called Ooster Doodkist.

The HINDER is an extensive *bank*, lying immediately before the entrance to Hellevet Sluys, to the northward of the island of Goeree, and to the westward of Voorn Island; forming on its south side, with the strand of Goeree, the West Gat; and on its N.E. side, with the West Plaats, the North Gat, leading to Hellevet Sluys. Near the middle of this bank is a *patch*, which dries at half-ebb, about a mile in length, and nearly $1\frac{1}{2}$ mile from Goeree Island: this is called the Steele Hinder. On the other parts of the Hinder, are from 2 feet to 2 fathoms; and to the westward of it, the depths gradually increase to 4 or 5 fathoms. Along its S.W. and south sides, is a long and shallow *patch*, called the *Bol*, or *Hompel*.

The West Gat is marked out by an outer black buoy, which lies N.W. by W. $\frac{1}{4}$ W., nearly, distant 2 miles from Houten Kaap, with the latter and Goeree Church in a line. On the bar are 13 feet water. The latter mark will take you to the southward of the Bol, or Hompel; and when within 2 cables' length of the shore, continue along,

keeping at that distance, until you arrive at the Kwade Hoek, leaving all the buoys on the port or larboard hand. After passing Kwade Hoek, off which a shallow spit extends, on which is a white buoy, the channel takes a S.S.E. and S.E. direction, and is called the South Deep. The Hinder Bank continues mid-channel to the south-eastward, and has over it some swashways, which are to be crossed in proceeding to Hellevoet Sluys; but these require a pilot.

The Slyk Gat lies to the northward of the Bol, or Hompel, and has two white buoys, to be left on the starboard, and five black buoys on the port or larboard side. On this bar are only 12 feet at low water. The outer buoy lies with Goeree Church S.E., distant $3\frac{1}{2}$ miles.

The entrance to the North Gat, between the Hinder Bank and the West Plaat, is about $\frac{1}{2}$ a mile wide, with $2\frac{1}{2}$ fathoms water in it. It is pointed out by a black buoy, with a vane, marked N.G. (North Gat), No. 1, on its N.E. side, and a white buoy, No. 1, on its S.W. side: the outer black buoy, No. 1, lies N.N.W. from Rokaanje Church; and the white buoy lies from the black buoy W. by N., distant $\frac{3}{4}$ of a mile. The entrance of the channel lies N.W. by W. from the Maas lighthouse, distant 3 miles, in which are only 2 fathoms at low water: to the southward of the outer black buoy, with a vane, for the distance of 2 miles, there are only 9 feet water; and a flat runs off here from the west side of the Voorn, nearly 2 miles, with only from 3 to 6 feet upon it, which narrows the channel very much. The Northern Gat should not be attempted without a pilot, and a flowing tide.

The **MAAS SAND** extends westward from the Hoek, or Hook of Holland, and joins the Hinder, forming a bar across the entrance of the River Maas, the passage over which is pointed out by buoys. The Maas River is narrow and intricate, and not to be ventured into without a pilot. The entrance to the River Maas is by a shallow swashway, called the Briel Gat, lying between the West Plaat and the Maas Bank. It is, as before observed, pointed out by an outer black buoy, lying in $1\frac{1}{2}$ fathom, on the Maas Bank. This buoy bears N. by W., $2\frac{1}{2}$ miles from the Maas lighthouse. At $1\frac{1}{2}$ mile S.S.E. from the outer buoy, lies another black buoy; and $\frac{3}{4}$ of a mile in the same direction, lies the third black buoy: these three buoys must be left on the port or larboard side going in. There are also two white buoys on the N.E. side of the West Plaat, to be left on the starboard side: these will point out the channel, which lies N. by W. and S. by E., and is about $\frac{1}{2}$ of a mile wide, with $1\frac{1}{2}$ fathom in it at low water.

The new channel into the Maas lies N.W. by W. from the Maas light, and commences at the outer black buoy of the Northern Gat, and is called the Spleet. In the night, one of the lights is shown in the direction of this channel, and the other in the direction of the Briel Gat. The Spleet is also buoyed; but as it is shoal, narrow, and intricate, it should not be attempted without a pilot.

DIRECTIONS FOR SAILING FROM OSTEND TO THE RIVERS SCHELD, MAAS, &c.

OSTEND TO SLUYS.—In proceeding from Ostend for the Swin of Sluys, keep along shore, within the Wendune Sand, in 3, 4, or $3\frac{1}{2}$ fathoms; and when you find yourself to the eastward of Blankenberg, you may keep more in-shore, and proceed near it, in 3, 4, or 5 fathoms, until you come to the buoy at the entrance, which, in going into the Swin, must be left on the port or larboard side. Between Ostend and Sluys there is but one spire-steeple, which stands near the latter place, with a square steeple betwixt them. When the spire-steeple comes between two sand-hills, and the square steeple is on with a large sand-hill, which lies to the eastward of the others, with a windmill standing between, you will be abreast of the buoy. The town of Sluys bears from the buoy S. by W. From the buoy, you must steer right in for the bluff part of Cadsand, your course in being nearly S.E., and then along shore to the southward. From the buoy to the town of Sluys, the distance is nearly 4 miles.*

WIELINGE.—If desirous of going from Ostend Road through the Wielinge, run

* For the distinguishing marks of the Belgian pilot-boats, see page 143.

along the shore, at the distance of $1\frac{1}{2}$ mile, in from 4 to 8 fathoms, leaving the Wendune Bank to the northward, until Bruges steeples come on with Blankenberg. Then haul off E. by N., until Flushing steeple bears E. $\frac{1}{2}$ S., when you will be in the Wielinge, and in $4\frac{1}{2}$ and 5 fathoms water: continue on that course, until Cassandria steeple bears nearly south. Beware of the Sluice and Cadsand Banks, going on either side, as most convenient; and having passed them, steer right on for Flushing. The mark for passing between the white buoy on the west end of the Cadsand Bank and the three black buoys of the Hompel, in 6 or $6\frac{1}{2}$ fathoms, is the Orange mill in one with Flushing light-house E. $\frac{1}{2}$ S.; or the steeple of Rittham, a little to the southward of Flushing steeple, on the same bearing. Rittham steeple is easily known, by having a large tree close to it.

A large vessel, from the northward, should bring Bruges steeples on with Lucifer's Duin, bearing S. $\frac{1}{2}$ E. This will lead to the outer buoy of the Wielinge, which may be passed on either side; and when Flushing steeple comes E. $\frac{1}{2}$ S., steer up the channel, as before directed.

SPLEET CHANNEL.—If coming from Ostend Road, and you are to the northward of the Wendune Bank, when Blankenberg Church bears S.E., and Ostend S. by W. $\frac{1}{2}$ W., in 7 or 8 fathoms, steer E. $\frac{1}{2}$ S. This course will carry you into the Spleet Channel, to the northward of the Inner Bank. In this passage there is a good depth of water; but it requires great skill and care to navigate, on account of its narrowness. The leading-mark for sailing through the Spleet, is Middelburg steeple on with West Kaapduin, bearing E. $\frac{1}{2}$ S., nearly. When to the northward of the Elboog, steer south-easterly for Flushing Roads.

The DEURLoo CHANNEL.—Vessels coming from sea for the Deurloo Channel, or the Eastern Scheld, commonly proceed between the Thornton's Ridge and Rabs; or between Rabs and the Stone Banks. To sail between the Thornton's Ridge and Rabs, you should bring West Kapelle Church S.E. by E. This will carry you clear to the northward of the Thornton's Ridge, and to the southward of the Rabs. Having passed the latter, steer a little more to the southward, and you will reach the outer buoy of the Deurloo. To sail in to the north-eastward of the Rabs, bring West Kapelle to bear S.E. $\frac{1}{2}$ S.; this will carry you to the south-westward of the South Stone Bank: and when Heyste Church comes on with Bruges steeples, steer south-westwardly for the outer buoy; but should you be desirous of going to the southward of the West Hinder, after passing at about 3 miles to the southward, your course should be E. $\frac{1}{2}$ S., until you arrive at the outer buoy. In this track you will pass to the southward of the Thornton's Ridge: and as soon as you perceive the island of Walcheren, bring West Kapelle a sail's breadth open to the northward of the high sand-hills, bearing S.E. by E. $\frac{1}{2}$ E.; proceed in that direction, until Heyste and Bruges steeples come in one: you will then be near the outer buoy of the Deurloo. Having reached the buoy, a S.E. by S. course will carry you between the Raen and Rassen Banks. The buoys will then be your best guide. If the buoys should be removed, proceed, as before directed, towards West Kapelle, until the steeples of Bruges appear 4-5ths of the distance from Leiswegan towards Heyste: then, making proper allowance for the tide, steer S. by E. $\frac{1}{2}$ E., until the S.E. mill at Flushing comes on with the small steeple, which is to the southward of the large steeple, and bears S.E. $\frac{1}{2}$ E. Keep it in this direction, which will lead abreast of Dishoek's signal-post: then steer directly for Flushing, taking care to avoid the western end of the Callot, where a buoy is placed, and anchor about $\frac{1}{2}$ a mile to the southward of the jetties.

In working in, you should tack on the north side of the channel, when the above mill becomes twice its apparent breadth open to the southward of the great steeple; and on the south side, when the mill appears midway between the small steeple before mentioned, and another small steeple to the southward of it (these steeples being but little above the tops of the houses); the mill will then be on with a white mark in the wall of the town. To go farther up the river, a pilot is indispensable.

When coming from the southward for the Deurloo Channel, and the weather be clear, you may run along the Raen, in 6, 7, and 8 fathoms, keeping Bruges steeples full $\frac{1}{2}$ from the Heyste, towards Leiswegan, until West Kapelle Church appears a sail's breadth open to the northward of the high sand-hills, bearing nearly S.E. by E. $\frac{1}{2}$ E.; then steer towards it in that direction, and proceed to the anchorage.

Although the above directions, in cases of necessity, may be useful, it is not advisable to enter the Deurloo Channel without an experienced pilot.

EAST GAT.—To sail for Flushing, through the East Gat and Zouteland Channel, you may steer with West Kapelle S.E. by S.; this will lead clear to the westward of the South Stone Bank: and having passed this bank, steer S.E. by E. $\frac{1}{2}$ E., which leads to the northward of the Caloo, and up to the outer, or red buoy. Then bring the mill to bear nearly south, and sail directly towards it; or in clear weather, you may bring Groede steeple, in Cadsand, just touching the point of West Kapelle, to which you should give a good berth in passing: you will thus pass between the Caloo and Kuerens, and be in the best water. You must now steer along shore, within 2 cables' length of it. The in-shore side is steep, the water deep, and the north side of the Caloo is flat. Continue to steer along the shore, to avoid Zouteland Banks. These begin near the mill, and run along parallel to the land, almost so far as Dishoeks Signal. When you have advanced thus far, you may run on, near the shore, to the south-eastward, for Flushing Road.

Flushing Road lies between the town and the western part of the Callot, and has good anchorage, in 9 or 10 fathoms; but in some parts there is deeper water. Gales of wind from the westward send in a heavy sea, which compels vessels to seek shelter higher up. Small vessels may find good riding inside the point of the Callot, to the eastward of Zuidwatering; but large vessels must run up the river, and seek shelter before Terneuse. On the N.W. end of the West Callot is a black buoy, lying with Flushing New Mill in one with Middelburg steeple.

On the 6th July, 1841, the Minister of Marine and Colonies gave notice, that in the middle of the channel of the roadstead of Flushing, a *shoal* had formed itself, of about 2 cables' length, in a S.S.W. and N.N.E. direction, which has been marked with a red buoy, placed at the following bearings, taken by compass, viz.:—the steeple of Middelburg N.E. $\frac{1}{2}$ N.; Fort Nellen N. by W.; the steeple of Hoofd Plaat S.E.; and the mill of Briskins S.W. $\frac{1}{2}$ S., in a depth of 12 English feet at ordinary low water. It is to be observed, that at the distance of 2 cables' length north and south of this shoal, there is sufficient water for ships of any draught to pass, without the least danger.

The VEER GAT.—Vessels coming from sea, and bound for Ter Veer, should pass between the Stone Banks, bringing Middelburg steeple on with Domburg steeple, bearing S.S.E. $\frac{1}{2}$ E. When within the banks, haul to the S.E., about $\frac{1}{2}$ or $\frac{3}{4}$ of a mile, and anchor in the Stone Deep, in 10 or 12 fathoms, good holding ground.

ROOM POT.—In proceeding from the above anchorage for Room Pot, steer S.E., eastward, until Middelburg spire draws near to the west end of a long wood, seen over the hills between East Kapelle and Domburg; or do not come into less water toward the Kuerens Bank than 5 or 6 fathoms, until they are in one: they will then bear about S. by E. $\frac{1}{2}$ E. Steer in that direction, until West Kapelle mill appears to the eastward of the Hakkelingen sand-hill, bearing about S.W. $\frac{1}{2}$ S.; the course from thence will be about E.S.E. to the Veer Gat.

In working in, the flat or shoal on the south side, as far in as Ooster Oog, will be avoided, by keeping a barn near the N.W. point of North Beveland, open of the main shore of Walcheren, bearing about E.S.E. On the north side there is no other guide than the buoys and the lead.

Having entered the Veer Gat, between the red buoy of the Onrust and the Bree Sand, the course towards the first black buoy is about S.E., until about midway between it and the white buoy opposite; it then becomes more southerly, till the steeple of Arnemuident comes on with the watch-house on the corner of the dike. This mark will lead close to the eastward of the white buoy on the N.E. point of the Scotchman, and also clear, but too close to the north black buoy of the Ruiten Plaat. It is, therefore, advisable to keep nearer to the beacons than to the buoy, and to steer abreast of the south white buoy directly on towards Ter Veer, keeping very close to the shore, until abreast of the town, and then anchor, or proceed onward in the same manner to the entrance of Middelburg.

The Veer Gat is narrow, on account of the *banks* with which it is encumbered, particularly between the spit of the Ruiten Plaat and the Scotchman, which is also very shallow at low water.

In sailing from Room Pot up the Eastern Scheld, it is necessary to observe, that the black buoys must all be kept on the port or larboard hand, and the white buoys, so far up as the Vuilbaard, on the starboard; but the white buoys of the Vondelingen Plaat and the Middle Plaat on the port or larboard.

We have already stated, that the Baanjiard Sand is divided, having a channel passing through its middle part, called the Middle or West Gat, and leading to the northward of the Neeltje Jans and Rug Plaat, towards Zierickzee; but as these sands frequently shift, and the channel is constantly varying, we forbear giving any further description. There is also a narrow passage which runs along the western shore of Schouwen, frequented by the natives, but totally unfit for strangers to venture through; indeed, the whole of these passages into the Scheld require a pilot, without the assistance of whom they should not be attempted.

BROUWERSHAVEN.—Vessels coming in from the northward, when they arrive at the parallel of Schouwen, will be within sight of the island of Walcheren, which may be easily known by its steeples, and the island of Schouwen to the eastward.

Brouwershaven Gat has lately been buoyed off, and forms now one of the safest ports. From its extent and depth, ships are enabled to get to sea, even with easterly winds; so that in the event of ice, they are, comparatively, not much endangered.

There are 15 buoys, viz.:—Seven black buoys lying along the Ooster, which, on entering, must be kept on the port or larboard hand; five white buoys lying along the New Sands and Schaar van Renesse, which consequently must be kept on the starboard hand; three red buoys, of which, one is placed on the west, and one on the east point of the sands, between the said Schaar van Renesse and the Ooster, both sides of these sands being navigable. The third is situated on the west point of the sands, called Hompelvoet. All these buoys are in from 20 to 30 feet water.

On entering this gat from the north, the lighthouse on West Schouwen must be brought to bear S.E. and S.E. $\frac{1}{2}$ E.; and keeping this course, until the steeple of Renesse bears a handspike's length south of the new-erected mark, called Ooster Doodkist, will lead to the outer black buoy. On the other hand, coming from the west, Goeree steeple must bear east and E. by S.; when, keeping this course, will lead to the outer white buoy; and from thence steering E.S.E. to the aforesaid mark, till between the fourth black and fourth white buoys, when the course must be changed to E.S.E. $\frac{1}{2}$ E., until north of the fifth white buoy, on the Schaar of Renesse; continuing between this and the two red buoys on the middle sands, and steering S.E. by E. unto the West Re-part and sixth black buoy; from which, E.S.E. $\frac{1}{2}$ E., till past the Ossenhooft, will lead to Brouwershaven Roads. In mid-channel there are from 30 to 40 feet water. Near the fourth white buoy, and E. by S. of the black buoy (No. VI.), is good anchorage.

Ships lying off, the new coast-light on West Schouwen must be brought between S.E. and E.S.E.; and if lying to the southward, they must not near the Banjaard after Goeree steeple bears east.

Springer Deep is a channel leading from Brouwershaven Gat to Goeree shore; and the Vlieger is a channel leading from Brouwershaven Roads, to the said Goeree shore. The requisite buoys have been placed for navigation. Should the wind not be fair, it is recommended never to enter without a pilot. Observe, that the outer black buoy off Brouwershaven Gat bears N.W. by N., distant $4\frac{1}{2}$ miles from Schouwen new lighthouse.

HELLEVOET SLUYS has two principal entrances; the southern, or West Gat, running along the side of the island of Goeree, and the channel over the north part of the Hinder Bank, and thence along by the island of Voorn, called the North Gat.

The WEST GAT, or that next Goeree Island, is regularly buoyed. Standing in from sea, and making Goeree Church, bring it to bear S.E. by E., and proceed in that direction, till the Houten Kaap appears; bring these two in one, and your course will be S.E. by E. $\frac{1}{2}$ E., to the outermost buoy (No. I). This buoy lies N.W. by W. $\frac{1}{2}$ W., distant 2 miles from Houten Kaap, which you must pass to the southward of. When the Church of Zierikzee is brought to close with the outermost sand-hills of Goeree Island, or if Zierikzee Church cannot be seen, when the westernmost sand-hills bear S. $\frac{1}{2}$ W., you will be within the point of the Ooster Bank, and the least water will be 13 feet. Now in sailing up, to keep clear of the Ooster, Goeree Church must not appear to the southward of Jan Pouwel's house, which stands a little to the westward of the Houten Kaap; and to keep clear of the Hinder, the said church must not appear to the northward of the Houten Kaap. Having, with these marks, passed the outer buoy, steer E.S.E. towards the Houten Kaap; but as the *flat* off the shore runs here pretty far out, give the strand a berth of full 2 cables' length distance. Opposite the Houten Kaap the channel is very narrow, and the banks on each side very steep; so that to

avoid both the strand and the Bol Baak, neither should be approached within 2 cables' length; at which distance, following the course of the shore, you will steer E. $\frac{1}{2}$ S., till you arrive near the Steen Baak, or Stone Beacon, when, the water deepening, you may keep the jetty-heads closer on board, until the third jetty, reckoning from the easternmost, is brought upon a line with Goeree Church, when it will be necessary to haul gradually to the northward, in order to clear the *spit*, which projects about a cable's length from the Kwade Hoek, on which a white buoy is placed, as well as because the flood-tide sets strongly upon the shore. Having brought Goeree Church in a line with the high downs, or sand-hills, near the entrance of Goeree Canal, steer S.S.E. $\frac{1}{2}$ E. into the Zuyder, or South Deep; but keep the Scherm, or mark near the channel to Middleharnis, always to the southward of Pieter beacon, to avoid the Scheelhoek Bank. Keep on thus, until you bring Briel Church upon a line with the stone head of De Kwak, on Voorn Island; and from this point, steering E. $\frac{1}{2}$ S., you will pass over the Pampas, in the deepest water upon it, and in the narrowest part. You will be upon the edge of it, when the Scherm appears to the northward of Pieter beacon; and over it, when Oudenhoorn Church disappears behind the houses of Hellevoet Sluys. You may then safely steer E.S.E., or in a direct line for Hellevoet Harbour, or Road. We have already mentioned the canal which takes you across the island of Voorn, into the Maas, near Rotterdam, at all times, in the space of about 4 hours.

To pass from the WEST GAT to Hellevoet Road, to the northward of the Scheelhoek, where there is more water than over the Pampas, proceed up the West Gat, as before, until you bring Goeree Church open of the easternmost of the jetty-heads; then steer E. by S., till you bring Hellevoet Church upon the white strand path, just to the westward of De Kwak. Then bring the church gradually nearer to the stone head of De Kwak, till Goeree Church is brought in a line with Ouden Oostdam, (a farmhouse at the side of Goeree Canal,) when you may steer right on for De Kwak, until you come into the deep water of the North Channel, and then proceed for Hellevoet Road.

There is a third way, called the new passage, near Middleharnis, but this is intricate and circuitous, although with still deeper water. To proceed by this way, when you have reached Stellendam, according to the first route, follow the course of the shore, steering S.E. by E., till you get Goeree Church a cable's length to the southward of Pieter beacon: keep it so, until Nieuwenhoorn, on Voorn Island, appears close to the westward of the wood at the hospital. Then steer E.S.E., until Goeree Church is brought in a line with Pieter beacon; and keeping these in one, will carry you through the narrows. When you have brought Briel Church to the eastward of the Hoornsche Hoofden, you will be clear of all the shoals. This part of the channel is now buoyed off.

THE SLYK GAT.—This passage lies to the northward of the Bol, or Hompel, and has 5 black buoys on the port or larboard, and 2 white buoys on the starboard side. There is also a red buoy near mid-channel, which lies nearly north of the Steen Baak, and where the Slyk unites with the West Gat. When coming in from sea for this passage, bring Goeree Church to bear S.E. Steer in that direction, and you will shoal your water gradually to 15 feet at the outer buoy at low water. Passing this buoy to the southward, and the 2 white buoys on the Bol to the northward, an E.S.E. course, $1\frac{1}{2}$ mile, will bring you into the West Gat; then proceed as before directed, passing to the southward of all the black buoys. The shallowest water in entering by this channel, is 12 feet. This is abreast of the second black buoy.

THE NORTH GAT is pointed out by 2 black buoys on the east, or port or larboard side, and a white buoy on the west side. Standing in from sea, bring Goeree Church to bear S.S.W.; and keeping this course, you will make the outer black buoy, having a small vane on it, and marked with the letters "N.G." (North Gat): this is to be left on your port or larboard hand. Its marks are, Briel Church just open to the northward of the Maas lighthouse, bearing S.E. by E.; Goeree Church S.S.W., nearly; and Rokanje Church S.S.E., distant $4\frac{1}{2}$ miles. From this buoy, the outer white buoy bears W. by N., distant $\frac{2}{3}$ of a mile. Run in about S. by W., 2 miles, and it will lead over the Hinder Bank, in 9 feet at low water, to abreast of the northernmost white buoys which point out the entrance of the Gat (Goeree Church will then bear S.S.W. $\frac{1}{2}$ W.), or until Briel Church comes in a line with the Pest-house. Here the channel begins to deepen, but at the same time is very narrow, and both sides are steep-to; so that, if

the buoys should by accident be removed, great caution must be observed. The course from this spot is S.S.E., which gradually brings Hellevoet Church and Scheelhoek Grove nearer together; they will be in one, when the Church of the Briel and that of Rokanje are so; and here you will arrive at another black buoy, to be left on your port or larboard side. Steer then S. by E. $\frac{1}{2}$ E., having for a land-mark a cluster of trees, at the point of Stad (a village just showing above the horizon in a S.S.E. direction), which must be kept open to the northward of Pieter beacon. Off De Kwak a spit of sand runs out, called the *Schaar*, which may be avoided, by keeping the Hoornschje Hoofden well open to the southward of Hellevoet Pier.

The ENTRANCE to the RIVER MAAS, which leads to Rotterdam, lies in latitude $51^{\circ} 57' N.$, and is commonly called the Briel Gat, or Channel. It has a bar across, on which there are $7\frac{1}{2}$ feet at low water, neap-tides; and the entrance is pointed out by two buoys, bearing from each other E. by N. and W. by S., distant $\frac{1}{2}$ a mile: the eastern one black, the western one white. The marks for the eastern one, which lies $2\frac{1}{2}$ miles from the N.W. part of Voorn Island, are the Briel Church nearly on with Zeeburg, bearing about S.E. $\frac{1}{2}$ S.; Rokanje Church, bearing about S. $\frac{1}{2}$ W.; and Munster Church, bearing about E. by N. $\frac{1}{2}$ N. The other, or white buoy, showing the west side of the channel over the bar, lies at the point of the West Plaat. Its marks are the Briel Church open to the northward of that of Oostvoorn, and Rokanje Church between the Pest-house and lighthouse, but nearer to the former, bearing S. $\frac{1}{2}$ E. There is another white buoy, with a vane, lying on the east side of the Plaat, which, must be kept to the starboard. These two white buoys lie N.W. and S.E. of each other, distant a mile. Standing in from sea, bring the Briel Church to bear S.E. $\frac{1}{2}$ S.; and steering this course, will take you to the outermost black buoy, which you are to leave on your port or larboard side. You may then, if the wind permits, run across the bar, with the Maas lighthouse bearing S. by E. $\frac{1}{2}$ E. (at night, one of the lights is shown in a N. by W. direction.) In this passage you will leave two other black buoys on your port or larboard hand; which course will bring you into the Pit, nearly opposite the outermost Salmon Wear. Along here, for some distance, the shore is bold, until you approach near to the Stone beacon. Here you must haul off from the strand, as the channel takes a circuitous route; and your course through the Zuid Bank Channel will be first E.N.E., East, E.S.E., S.E., S.S.E., and S. to S.S.W., and lastly South, to the light at Briel. There is a narrow channel close along, shore from the Stone beacon up to Briel. In this channel you will leave 3 buoys on your port or larboard hand. The Zuid Bank Channel is also well buoyed off; but vessels bound to the Maas must take a pilot.

There is also a channel into the Maas, to the southward of the West Plaat, with $7\frac{1}{2}$ feet water in it. The entrance to this channel is by the outer beacon-buoy of the Norder Gat, which lies with Goeree Church S.S.W., nearly; and Briel Church S.E. $\frac{1}{2}$ E.: either of these marks will bring you to the outer beacon-buoy. At night, the Maas lighthouse shows one of its lights in a N.W. by W. direction; and is visible about 3 miles. It will then be nearly on with the light at Briel. By day, steer S.S.E. from the black beacon-buoy, $\frac{1}{2}$ of a mile, for another black buoy at the entrance of the narrows. Pass close to the southward of this buoy; then haul up E.S.E., or E. by S., passing between it and a white buoy near it, which you must leave on your starboard hand; continue on about E. by S. $\frac{1}{2}$ S., for $1\frac{1}{2}$ mile, passing between two smaller white buoys. You will then enter the former channel, and must proceed as before directed. This latter channel is named the Spleet; but as the tide only rises 6 feet, the Maas should not be entered until after half-flood.

TIDES.—The times of high water, and the rise of the tides, at the full and change of the moon, are as follow:—

At Calais it is high water at 30 minutes after 11 o'clock; spring-tides rise from 16 to 19 feet, neaps from 14 to 15 feet. At Gravelines and Dunkirk, at 11h. 55m.; spring-tides rise from 16 to $19\frac{1}{2}$ feet, neaps from 14 to 15 feet. At Nieuport, 12h. 0m.; spring-tides rise from 15 to 18 feet, neaps 14 to 15 feet. At Ostend, at 20 minutes after 12; spring-tides rise from 14 to 16 feet, neaps 12 to 14 feet. At Flushing and Vere, at about 20 minutes past 1 o'clock; spring-tides rise 13 feet, neaps from 10 to 11. At Terneuse, at 2. At Bathz, at 3 o'clock; spring-tides rise from 13 to 14 feet, neaps from 11 to 12 feet. At Antwerp, at 25 minutes after 4 o'clock; spring-tides rise from 13 to 14 feet, neaps 11 to 12 feet. At Camp Veer, at half-past 1; spring-tides

rise from 17 to 18 feet, neaps from 11 to 12 feet. At Brouwershaven, at 2 o'clock; spring-tides rise 10 feet, neaps 8 feet. At the entrance of the West Gat, at Goeree, at $\frac{1}{2}$ after 1 o'clock. At Hallevoot Sluys, at 2h. 30m.; spring-tides rise 8 feet, neaps 6 feet. At the Briel; at 3 o'clock; springs rise 6 or 7 feet.

Remarks on the Tides, from Calais to the Maas.

THE rise of the tides on the coast of Flanders is very irregular, and much dependent upon the moon's age, and the strength and direction of gales of wind; thus, with easterly winds, they will rise and fall 3 or 4 feet more than with westerly winds. In general they will, at the end of 3 hours' flood, have risen one-third; that is, if the tide commonly rises 13 feet at high water, at half-flood it will only have risen 4 feet above the low water mark. Between the 3rd and 5th hour, the rise becomes very considerable, and from the 6th hour it gradually diminishes.

The ebb-tide falls half its quantity between 3 and 3 $\frac{1}{2}$ hours after high water; it then falls gradually to the 5th hour; and, during the last hour of ebb, its decrease will scarcely be perceptible.

With spring-tides, the stream runs from 3 $\frac{1}{2}$ to 4 $\frac{1}{2}$ knots; and with neaps, from 2 to 3 knots. The general direction of the stream is east and west, the first of the flood inclining towards the shore, and the first of the ebb towards the offing.

At the entrances of the Scheld, the current runs in the direction of the various channels, except where there is deep water over the banks. Both flood and ebb will continue running in the offing full 2 or 3 hours after it is high or low water on the shore, a circumstance which, in crossing the banks, should be particularly attended to; therefore the time of high water must be calculated without attending to the current, or you may mistake for the time of high water, the period when it has fallen 4, 5, or 6 feet on the banks.

At the East Gat of West Kapelle, the first of the flood sets to the southward, and the middle and after parts right inwards, through the East Gat. The first of the ebb sets very strongly to the northward, and the middle and after parts set right out through the east entrance. When the flood begins to run at sea, it is the first of the ebb in the East Gat; and when the ebb begins to run at sea, it is the first of the flood in the east entrance. At the outer buoys of the Deurloo Channel, the first of the flood sets strongly to the southward, the middle part S.E., and the latter part right in through the channel; the ebb sets in contrary directions. The flood stream along the coast runs nearly in the direction of E.N.E., till opposite Briel Bar, when it runs N.E., following the bend of the Hook of Holland.

Before Goeree Island, the first half of the flood sets off shore; but, before the Maas River, it sets on the shore, except with southerly winds, when it sets off for the most part; so that, with a strong breeze from that quarter, the buoys upon the shoals of the Maas hardly change their north-easterly drift or swing.

In the channels between Goeree and the Hook of Holland, the flood in common tides runs but little more than 4 hours, while the ebb runs nearly 8. With the flood, the water continues to rise about 3, and with the ebb to fall about 7 hours, remaining for the rest of the time nearly at a stationary level.

Before Goeree Island, with quarter moon, the tide usually rises about 5 feet 7 inches, but on the Briel Bar, 6 feet; and, upon an average, it does not rise, during the first hour and a half of the flood, about one-fourth of its whole height, attaining its highest point in the next two hours, and remaining nearly at that level till the ebb runs through. During the first 2 hours of the ebb, it falls at the rate of 10 inches in each hour; after which it continues to fall about a foot in the same space of time, till towards the last of the ebb, when it again diminishes to 10 inches per hour.

Before the banks of Schouwen and Goeree, the tide turns about with the sun. The after-flood sets into the channels, and then bends to the southward till the running of the ebb; but the ebb runs right out to sea, and the first flood sets a short time to the northward.

By attending to the current when off the coast of Holland, in calm weather, and out

of sight of land, it may easily be perceived whether you are to the northward or southward of the Maas; for, to the northward of the Maas, the stream of flood turns about with the sun, but to the southward, against the sun, till the last quarter-tide, and then it sets in towards the land.

FROM THE MAAS TO THE TEXEL.

Description of the Coast.

FROM the Hook of Holland to the Texel, the land is level and low, but abounding everywhere with small white sand-hills; and the coast is so clear from dangers, that you may run along it all the way, in 5 or 4 fathoms. The land contiguous to the coast is distinguished by the following towers, churches, lights, and beacons; but the beacon-lights of Katwyck, Noordwyck, and Wyck-op-Zee, are only occasional lights, intended principally for the use of the fisheries.

Gravezande lies about N.E. from the Hook of Holland, and formerly had a high spire-steeple, which is now pulled down. Near Gravezande is Hogewoerd, Munster, and Ter Heide. Four miles to the north-eastward of Gravezande, you will see, about $1\frac{1}{2}$ mile inland, the square steeple of Loosduynen, having a small turret upon it, and near the shore, a white sand-hill, rather more elevated than the others. Almost 4 miles from the Loosduynen, but near the shore, is Scheveningen, a small fishing town, with one church and a little spire-steeple, the land about it appearing in little hummocks. At Scheveningen is a fixed light, placed on a stone tower, erected on the downs, southward of the village, and near the beach, in latitude $52^{\circ} 6' 16''$ north, and longitude $4^{\circ} 16' 20''$ east. It is $75\frac{1}{2}$ feet above high water mark, visible at the distance of 6 miles from north to west. This place may readily be known by the steeples of the Hague, which are situated $2\frac{1}{2}$ miles inland, one of them being large and square, with a spire on its top. Seven and a quarter miles beyond Scheveningen, is Katwyck-op-Zee, lying on the edge of the shore, distinguished by one large church, with a small spire-steeple. A little to the southward is a beacon, appearing at sea like a steeple. Between Scheveningen and Katwyck, the steeples of Westenaar, Valkenburg, and Katwyck Binnen will be seen. A little to the northward of Katwyck-op-Zee, is the entrance of the canal, which runs to Leyden. Nearly 3 miles beyond Katwyck, is Noordwyck-op-Zee, having a square steeple and small spire. Just to the southward of Noordwyck is a light-beacon. About a mile inland is Noordwyck Binnen, having a church, with a square steeple and a light-beacon upon it. There is also a small tower, apparently standing on the middle of the church. At $2\frac{1}{2}$ miles to the north-eastward is Noordwyckerout, situated $1\frac{1}{2}$ mile inland. There is also a small place farther northward, but nearer the coast, called Langevelder Kapel. Zandvoort is about $8\frac{1}{2}$ miles from Noordwyck, and has a tall spire-steeple and light-beacon near it.* When you are opposite this place, you will see a large house, with a barn close to it, and to the southward, a hummock, appearing somewhat like a beacon. Sand-hills continue all along the shore. About 8 miles beyond Zandvoort, is Wyck-op-Zee, having a church, with a square-steeple, and a sand-hill close by the shore, which appears higher than any of the other land thereabout. When the steeple and this sand-hill are in a line with each other, the former seems to stand on the latter like a lighthouse. The land here appears double, with white sand-hills somewhat higher than the land to the southward. It is distinguishable, when coming in from the sea, by Haarlem Church, which stands at some distance inland, with a spire-steeple in the middle of it; also by Beverwyck, which lies 6 miles to the northward of Haarlem, with a spire-steeple, high, and somewhat bluff.

At $7\frac{1}{2}$ miles from Wyck-op-Zee, is Egmond-op-Zee, where there is a bluff square steeple, and two light towers standing close to it.† Wyck-op-Zee has two light bea-

* This light only burns when the fishing-boats are out at sea.

† There were formerly coal fires; but in 1834, they were replaced by two fixed reflecting lights, exhibited from new light towers, and visible $4\frac{1}{2}$ miles, 15 to a degree, and illuminates the horizon from N. by E. through north, and south to S.S.W.

cons or lighthouses by it. The adjacent land is low, with some scattered sand-hills. Inland you will perceive the three churches of Egmond Binnen, Egmond-op-de-Hoef, and Hylloo, one of these being large. At $4\frac{1}{2}$ miles inland stands the city of Alkmaar.

About 2 leagues to the northward of Egmond-op-Zee, is Camperdown, or Schoorl-down, the highest land on the Dutch coast, it being a large sand-down, in latitude $52^{\circ} 41\frac{1}{2}'$, which, at a distance, appears in hummocks, and may be seen, in clear weather, when in 14 fathoms water, at the distance of 20 miles.

The churches of Schoorl, Groet, and Kamp lie adjacent; and to the northward, 9 miles from Egmond, is the town of Petten, the church of which has the appearance of a barn, when viewed from either the southward or northward; but when abreast of it, the steeple is pointed, and seems to be built on the middle of the church. Petten appears in hummocks, and has several mills about it. Close to the town is a sand-hill, upon which you will see a large building like a lighthouse. At $3\frac{1}{2}$ miles to the northward of Petten, is a *knoll*, lying near the shore, and called the *Polder*, with 2 fathoms on it. At 4 leagues to the northward of Petten is Kyckduyn, which is a high white sand-hill. Near it is a fort and lighthouse. The latter exhibits a strong-reflected, fixed, and permanent light, 150 feet above high water mark, and visible 16 miles all round. The land between Petten and Kyckduyn is composed of small sand-hills, appearing at a distance like detached hummocks; and near the Polder is the church of Calandsog.

About a mile beyond Kyckduyn is a point of land, upon which stands a small battery. From thence the coast turns directly eastward to the Helder. Between this battery and the town stands a large fortress.

The Texel Island lies to the northward of the Helder, its southern part being distant nearly 2 miles. It has a low appearance, and, like the coast we have described, abounds with sand-hillocks. On it are four churches, three of which have steeples; the fourth, is without one, and roofed with blue slates. The Texel Island is about 11 miles long, and its southern part 5 miles broad; but towards its northern extremity it becomes narrower. Between the Helder and this island, is the great and much-frequented channel leading to the Zuyder Zee. Before its entrance lie the extensive and dangerous *sands* called the *Haaks*, which divide it into several channels; of these the southern ones are the most frequented, being sufficiently deep for the entrance of the largest ships.

The southern entrance to the Texel bears from Orfordness E. $\frac{1}{4}$ N., distant 42 leagues; from Yarmouth E. by S., 36 leagues; from the Humber S.E. $\frac{1}{2}$ E., distant 54 leagues; from Flamborough Head S.E. $\frac{1}{4}$ S., nearly 60 leagues; and from the Hook of Holland N.E. $\frac{1}{2}$ N., 22 leagues.

SAILING DIRECTIONS FROM THE MAAS TO THE TEXEL.

IN sailing from the southward for the Texel, you may keep along shore, in 4, 5, 6, and 8 fathoms, or deeper water, regulated by your distance from the land. There is no danger in your way, until you reach the Polder, which lies so near the shore that it may easily be avoided. A N.E. course will bring you to the entrance of the Helder; but vessels coming from seaward, or the English shore, should endeavour to fall in with the Camperdown Hills, which, as before observed, is the highest part of the whole coast; and strangers must be particularly careful not to mistake Kyckduyn for Camperdown, lest they should fall in with the Haak Banks before they are aware of them; for these are steep-to and dangerous. Having, therefore, made sure of Camperdown, you may safely stand in towards the land, and run on, in 7, 6, and 5 fathoms, only steering clear on the outside of the Polder, which is situated off Calandsog; and as you approach Kyckduyn, you will see two small beacons which are erected on the sand-downs; these brought in one, serve as a leading-mark to the outer buoy; or, if by night, keep the light at Kyckduyn about N.E., and it will run you in, mid-channel, between the buoy and the shore.

[NORTH SEA.]

In approaching the Haaks from the westward, great care is requisite, to avoid coming too near them; for they are steep-to, shifting suddenly from deep to shallow water; and many vessels have been wrecked for want of using proper precaution: it is, therefore, advisable not to get into less than 12 or 11 fathoms water; and when in that depth, to endeavour to round the sands, either to the northward or southward.

The Haaks are very dangerous sands, composed of many patches, which are frequently shifting, and have several channels between them. The southern channels now in use, are the Schulpe Gat, or Inner Channel, and Land Deep.

DIRECTIONS FOR SAILING INTO THE TEXEL.

The SCHULPE, or SOUTH GAT, lies along the shore, its entrance, opposite the outer buoy, being not less than $1\frac{1}{2}$ mile wide; but becoming very narrow as it approaches the Helder, where it takes the name of the Drempeel. The port or larboard side of this channel is pointed out by 8 black buoys, all placed upon the inner edge of the South Haaks. The outer buoy lies in $4\frac{1}{2}$ fathoms, with Kleine Kaap beacon, just open north-westward of the lighthouse at Kyckduyn, bearing N.E. $\frac{1}{2}$ E., distant 4 miles; and the two Sand Dyck beacons in one, bearing S.E. $\frac{1}{2}$ E. The second buoy bears from the first N.E. $\frac{1}{2}$ N., distant $\frac{3}{4}$ of a mile. The remainder of the buoys are laid in a N.E. direction, about $\frac{3}{4}$ of a mile apart. There are also 4 white buoys, to be left on the starboard side when entering; three of these buoys are laid on the edge of the bank in the narrows, near the lighthouse. The fourth is laid on a 3-fathom bank, about a mile within the south-western entrance. These buoys will direct you through the Schulpe Gat. But supposing them to be removed from their stations, the mariner must take good care to go round to the southward of the Haaks, bringing the south point of the Sand Dyck* about E.S.E., or the Sand Dyck beacons in one; and when the Kleine Kaap, or Lower Beacon, appears at the foot of the Kyckduyn light, or about a handspike's length open to the northward of the light, you will then be near enough to the shore, and may sail, with this mark on, past the assigned place of the outer buoy; but if you come from the northward, you must take care to avoid the southern end of that part of the Haaks called the Middle Rug, which you will readily effect, by getting the houses of Goete Keet, south of Nol, to the southward of Keeter Flakte; or by keeping Calandsog just open to the southward of the sand-hill, bearing about S. by E. $\frac{1}{2}$ E., keeping this mark on until you are near enough to the shore to clear the South Haaks. The southern part of the Haaks is very flat, with from 19 to 27 feet over it. Having cleared the southern point of the Haaks, steer N.E. by N. to near the fourth black buoy; then a N.E. course will take you through, in mid-channel. The leading-mark for entering this channel from the south-westward, is de Westen, between Den Heuvel and Jonge Pietersduyn, on Texel Island, bearing N.E. $\frac{1}{2}$ N. When passing the light, keep at 2 cables' length from shore, by which you will avoid the Zwemmer; then steer about E.N.E. towards the Drempeel, keeping mid-channel, and clear of the two stony points, as well as of the sand, which you will do by bringing the Hoortje open of the stones at the battery point.

At the point of Ooster Hooft lies a white buoy, which you will leave on your starboard side. The passage of the Drempeel has 4 fathoms water in it. It is bounded on the eastern shore by the in-shore sand, and to the westward by the Droge Bol, over which are from 16 to 20 feet water.

The WEST GAT divides the Southern Haaks into two parts, and is somewhat circuitous. The eastern part of this bank is named the South Haak, and the outer, or western part, the Middle Rug. The passage between is a mile wide, and was formerly much frequented by large ships; but the Schulpe Gat is now preferred. This channel is now buoyed off with 6 black buoys, to be left on your port or larboard side in entering; and 5 white buoys, on your starboard side.

* The Bollen of the Sand Dyck is high, and, from the sea, very conspicuous.

To proceed through this channel, should the buoys be gone, you will, as in approaching the Schulp Gat, get the Sand Dyck to bear E.S.E., or the Sand Dyck beacons in one, bearing S.E. $\frac{1}{2}$ E., until you get the Hoorn Church, on the Texel, to bear E.N.E., or seen between Den Heuvel and Jonge Pietersduyn. This is the leading-mark for the West Gat, the outer black buoy of which lies W. $\frac{1}{2}$ N., 5 miles from Kyckduyn lighthouse; and the outer white buoy, which lies S.S.E., $\frac{1}{2}$ a mile from it, mark out the entrance; and between them is a *bar*, of 3 and $3\frac{1}{2}$ fathoms, about $\frac{1}{2}$ a mile broad. Crossing this, you will deepen your water to 6 and 10 fathoms in mid-channel. When entering, steer E.N.E. across the bar, with the before-mentioned marks on, until past the second black-and-white buoys: then an east course will take you up in mid-channel, between the buoys, into the Texel Roads.

DUINKER'S GAT.—There is a channel, which separates the North from the South Haaks, called Duinker's Gat, which is narrow, and used only by the native fishermen; yet there appears to be not less water in it than $3\frac{1}{2}$ fathoms, which is near the middle of the passage. It is very circuitous, and has neither buoy nor beacon to sail in by.

The south side of the Duinker's Gat is quite clear; but the northern side has many projecting points. By bringing a very conspicuous house at the New Deep to the northward of the town of Helder, you will go quite clear of the southerly part of the Northern Haak.

To the northward of Duinker's Gat is a swashway, of 2 and $1\frac{1}{2}$ fathom, used also by small vessels and fishermen. The northern part of the Northern Haak is called the Ezels, and has from 3 to 8 feet water over it.

THE NORTH, or NEW GAT, is a narrow channel, running along parallel to the Texel Island, bounded on the eastern side by the *sandy flat* called the *Horse*, and to the westward by the Ezels and North Haak. This channel has a *bar* across it, near the middle, with only 9 feet on it; and it has so much grown up, that all the buoys have been taken away: even a small vessel should not attempt it without a pilot.

The *Horse* is a long *sandy beach*, which lines the west and S.W. part of the Texel, and forms one side of the New Gat. At its S.E. end it bends inwards to a kind of shallow bay, of clay and mud, where boats and sloops may run in; on the north-eastern side of which is a good landing-place. About 2 miles from the Helder Point is the New Deep. The course from Helder Road up the Texel Stroom, is E.N.E. $\frac{1}{2}$ E.; and vessels frequently run to the anchorage at the eastward of Schans.

Two lights have been placed on the Weirhoofd, or Weirhead, which mark out the N.W. entrance to the New Deep—one nearly at the extremity of the Weirhead, showing a white light, placed 8.86 ells above the level of the sea; the other in a north-westerly direction, 67.60 ells inside the former, and 10.67 ells above the level of the sea, showing a red light, first lighted April 1st, 1843. They may be seen by vessels coming from the sea, as soon as they have passed the Westerhoop; and may be also clearly perceived from all points of the roadstead of the Texel, and the Texel stream up to the Texel Harbour, and to the Balg. As soon as the red light bears a little to the south of the white light, the entrance to the New Deep is open; and by steering S.W., the "Corps Morts" before the New Deep, and the Old-hoofd along the Weirhead, will be avoided; and steering along by the lights, the New Deep may be entered with safety.

GREAT DUTCH CANAL.—A grand canal is now formed from the Helder to Amsterdam, the object of which is to afford a passage for large vessels from the City of Amsterdam to the sea. The City has 40 feet water in the road, fronting its port; but the pampas, or bar, in the Zuyder Zee, 7 miles below, has only 7 feet; hence all ships of any considerable burthen, have to unload part of their cargoes with lighters, before they can enter the port. As the Zuyder Zee is full of *shallows* throughout, all ordinary means of improving the access to the port were necessarily ineffectual; and it was, therefore, determined upon cutting a canal from the town to the Helder. The distance between the two extreme points is 41 English miles; but the length of the canal is $50\frac{1}{2}$ miles. The breadth of the surface of the water is 124 feet; the breadth at bottom 36 feet; and the depth 20 feet 9 inches.* Like the Dutch canals in general,

* We have been informed, there are only 14 feet in the canal.

its level is that of the high tides of the sea, from which it receives its supply of water. It requires only two tide-locks, one at each of the extreme points; but there are two sluices besides, with a flood-gate in the intermediate space. It has 18 draw-bridges. The locks and sluices are double—that is, two in the breadth of the canal. These are built of brick, with bands of lime-stone at intervals, projecting out about an inch beyond the brick, thus protecting it from abrasion by the sides of the vessels passing. A broad towing-path is on each side; and the canal is wide enough to admit one frigate passing another.

This canal takes its course from the River Ye; first running north to Purmerend, then west to Alkmaar Lake, then north again, by Alkmaar, to a point within 2 miles of the coast near Petten, and thence in a direction parallel to the coast, so far as the Helder, where it joins the fine harbour of Nieuwe Diep. At this latter place is a powerful steam-engine, for supplying the canal with water during neap-tides, and for other purposes.

The time spent in tracking vessels from the Helder to Amsterdam, is commonly 18 hours. Immediately opposite to the Helder, there are 100 feet water at high tides; and at the shallowest part of the bar, to the westward, are 27 feet. There are 40 feet water at the port; while above and below it, are not more than 12 or 10 feet. To vessels leaving Amsterdam, which formerly were detained by adverse winds in the Zuyder Zee, oftentimes for weeks, this canal must prove extremely advantageous.

With the wind strong to the west or W.N.W., there is always a heavy and broken sea in the Texel Road; and as the ground is exceedingly bad to hold an anchor, it is better to come-to in deep water, before you get upon the bank, in 10 or 12 fathoms, as here the ground is better, and you have to drag up the bank; but if you come to on the height of the ground, which is loose, you will drive off again into deep water, and be on shore upon the sand before it is possible to bring-up, even with 4 anchors a-head, the ground being nothing but soft mud.

Large ships cannot leave the Texel by the Schulpe Gat, unless the wind blows from between the north and E. by S.; but as it will always be found requisite to obtain a pilot, a further description will be unnecessary.

It is high water, full and change, at the Schulpe Gat, at 7h.; at New Deep, 7h. 25m.; at Oude Schild, 8h. 45m.; in Texel Stroom, 8h. 30m.; at the entrance of the North Gat, 6h. 45m.; and without the Haaks, at 6 o'clock.

TIDES.—The tides in the Texel usually rise 4 feet. Flood-tides generally run in the Schulpe Gat N.N.E., or incline more to N.E. In the Land Deep they run first N.E. along the South Haaks, as far as the Bree Wyd, and from the Bree Wyd to the Helder, east, through the Texel Stroom N.E., through the Duinker's Gat, and as far as the eastern end of the Middle Rug, N.N.E., where it joins the Land Deep in the Bree Wyd, and, as before observed, takes an easterly direction. In the North Gat, the flood comes up 3 hours later than in the Schulpe Gat. Following the channel between the banks, till having passed the Laan, it joins the general stream, and runs up eastward to the Hoorntjee. This tide then turns N.N.E., and follows the course of the roads; while the flood at the New Deep turns to the south-eastward, through the Weiringer Balg. The ebb is commonly in the opposite direction to the flood, and runs with great force upon the Helder, although the flood still runs out of the North Gat, and is in direct opposition to it. The course of the currents, and the different directions they take, from the beginning to the end of the flood and ebb-tides, require the greatest attention, and cannot be attained without much practical knowledge. In general, the stream of tide follows the course of the banks, and is both strongest and longest where the water is deepest. At the Drempeel the water never stands still, the flood and ebb succeeding each other immediately, without intermission. These are all the general rules which can be given for the tides here, as the prevailing winds, and other local causes, continue to influence their influx and reflux, and cannot be ascertained without absolute practice.

In the offing, a little before half-flood, the stream sets directly into the Texel; and from about half-ebb to half-flood, it sets directly out; but the first of the flood, with the latter part of the ebb, sets nearly N.N.E. over the banks and out of the North Gat; and the latter part of the flood, with the first part of the ebb, sets nearly S.S.E. over the South Bank, till nearly half-ebb.

Along the coast of Holland, with the wind to the southward of west, there is no assistance from the ebb, in turning toward the Maas, or beating to windward; because, with such winds, there is no ebb running by the shore.

FROM THE TEXEL TO THE ELBE AND WESER, &c.

Description of the Land, &c.

THE land to the northward of the Texel continues low, and is fronted by numerous small islands, which, in clear weather, are visible 4 or 5 leagues off at sea. Between these and the main are various passages and channels, leading to the different towns situated upon the coast; and within this space are the large rivers of the Ems, Jahde, Weser, Elbe, and Eider; the last communicating, by the Canal of Rendsburg, with the Baltic, or East Sea. Numerous *sand-banks* also surround the shores, some of which are particularly dangerous, and will be described hereafter. The islands which lie between the Texel and Weser are, Vlieland, Ter Schelling, Ameland, Schiermonnik Oog, Rottum, Borkum, Juist, Nordeney, Baltrum, Langer Oog, Spiker Oog, and Wanger Oog. Many of these islands have been encroached upon by the sea, which threatens to annihilate them at no remote period, unless prevented by art and industry.

VIELAND is a long narrow island, running to the north-eastward nearly 10 miles. However, on the north part is a village, several beacons, and a lighthouse, showing a bright fixed light, visible, in clear weather, nearly 4 leagues off, intended chiefly to direct vessels into the Vlie Stroom.*

The **VLIE** is a broad channel, formed between Vlieland and Ter Schelling. It is encumbered with several *dangerous sand-banks* at its entrance, which divide it into four distinct channels, two being to the westward, and two towards the N.E.

TER SCHELLING is about 9 miles long, and $2\frac{1}{2}$ broad, running in an east and west direction. It is surrounded by a *sand-bank*, of shallow water. On its western end are two beacons, Brandaris tower, and two towers, and near them the village and church of West Schelling. There are three other villages on the island—Midland, Hoorn, and Oosterend.

Ter Schelling Coast Light is a revolving lenticular lamp-light, of the second size. At the distance of 4 miles, 15 to a degree, this light is not visible during 14 or 15 seconds. The light is placed on a tower, called the Brandaris, on the west coast of the island, in latitude $53^{\circ} 21' 40''$ north, and longitude $5^{\circ} 13' 7''$ east of Greenwich. It is placed 177 feet above high water mark, is visible at a distance of 5 miles, 15 to a degree (20 miles), and illuminates the horizon entirely.

The Western Gat of the Vlie Stroom is called the Stortemelk, and is both narrow and intricate. At its entrance is a buoy, coloured red-and-black, bearing about N. by W., $2\frac{1}{2}$ miles from the lighthouse on Vlieland. There are several other buoys within the bar.

HOLLEPOORT.—The principal entrance to the Vlie Stroom is the Hollepoort, which lies between a bank on the north side, called the Noorden or North Buitengrond,

* **CAUTION.**—Captain Galloway, of the *Union*, of London, who has just returned from Harlingen, stated, in reference to the supposed loss of the *Bellona*, Austrian frigate, on Eierland Reef, which lies between the Texel and Vlie Island, that the report is false; but had it taken place at the point spoken of, it would not have created any surprise, as the light on Kyckduyn, going into the Texel, is a single light, and the light on the Vlie Island also single; the reef between the two islands running off about 4 miles, not the least notice being taken of it, either in the English or Dutch charts; so that a stranger, rounding the Haaks by the charts, might go along shore in safety; but the Eierland Reef will pick him up, in 9 fathoms water, and before you can get another cast of the lead, you are on shore.—*London, December, 1842.*

The revolving light placed on Brandaris Tower, on the west end of the island Ter Schelling, may be seen, in clear weather, 20 miles. This cannot fail to be of the greatest service to mariners navigating this dangerous part of the coast.—[Ed.]

and on the south side, called the Wester Grond, on the N.W. side of which is a white buoy. The outer buoy of the Hollepoort is red, and lies with a beacon on the strand of Vlieland in one with a mill on the south side of the island, bearing S. $\frac{1}{2}$ W., and the S.W. end of the Ter Schelling S.E. by E. On the north side of the channel is a black buoy, a mile within the outer buoy, and a white buoy on the south side, distant $1\frac{1}{2}$ mile from the black buoy. This is called the Ton van Engelsch Hoek, or English Hook buoy, and lies on the western side of the Vlie Stroom. At the entrance to this channel the depth is 5 fathoms, farther in 4 and $3\frac{1}{2}$, and in the Stroom increases to $8\frac{1}{2}$ fathoms.

NEW GAT.—The entrance to the New Gat lies nearly E. by N., 5 miles from the Hollepoort, and is a convenient passage for vessels from the northward. It is between the Noorden Buitengrond on the N.W. side, and the Noord Vaarder on the S.E., the course in being nearly W.S.W. $\frac{1}{2}$ W. The first, or outer buoy, is black, with a beacon, and lies with the two beacons on Ter Schelling in one, and the two beacons on the Noord Vaarder in one; and within are three other black buoys, to be left on the port or larboard side. Opposite the last of these, is the before-mentioned English Hook buoy. The second buoy bears from the first S.W. by W., distant a mile; and the third from the second W. by S., at nearly the same distance; and the fourth from the third S. $\frac{1}{2}$ W., a mile. Above the English Hook buoy are two white buoys, which are to be left on the starboard hand, marking the entrance to the Vlie Stroom. The depth at the bar is 3 fathoms, increasing to $4\frac{1}{2}$ mid-channel opposite the second buoy, and to 5 at the third buoy, and farther on to 8 and 9 fathoms. Off the last white buoy, on the starboard side, are 10 and 12 fathoms in the middle of the stream, where the channel widens to $\frac{3}{4}$ of a mile, the course of the Vlie Stroom being S. by W., about 4 miles, with 7, 10, 11, 7, to 5 fathoms, so far as the road, which is 2 miles above the eastern point of Vlieland.

Besides the above passages into the Vlie, there is another to the eastward. This runs in very near the west part of Ter Schelling; but it is too narrow and intricate to be attempted by any but small vessels, and those well acquainted with the passage.

From the east end of Ter Schelling, a dry bank extends nearly 5 miles, called the *Bosch*, which appears to have formerly constituted part of that island, and now forms the western side of the Ameland Gat, which lies between it and the island of Ameland. This gat has three entrances; the N.W. Gat, the Akke Polle Gat, and the N.E. Gat. The island thence extends E.S.E. $\frac{1}{2}$ E., about 11 miles, with much broken land; but upon it are several villages, the chief being Hollum, near its west end.

The N.W. Gat lies between the Bosch on the south side, and a long narrow sand on the north side. It is very narrow, with only 12 feet over the bar; but the depths within increase to 4 and $4\frac{1}{2}$ fathoms. At a considerable distance without the bar is a red buoy, in 5 fathoms, lying with a beacon on the west end of Ameland, in a line with the church at Hollum. S.E. $\frac{1}{2}$ E., 2 miles within this, is the first black buoy, on the starboard side of the channel; and beyond this, two other black buoys, on the same side, being at about a mile distant from each other; the channel then continues about E.S.E., for more than a mile, into the main stream, within Ameland. There are four white buoys on the port or larboard side of the channel.

The Akke Polle Gat lies to the northward, nearly parallel to the N.W. Gat. It is not buoyed, although it appears to have 3, 4, and 5 fathoms water within it. Hollum Church in a line with the western down or hummock of Ameland, bearing S.E. $\frac{1}{2}$ S., is the mark for the entrance to this gat.

The N.E. Gat lies between the Born Reef on the west side, and the bank on the shore of Ameland. It is about a mile wide, and extends 4 miles to the W.S.W. The bar, which is 2 miles wide, has from 12 to 9 feet over it at low water, the leading-mark, through the best water, being two beacons, standing on the eastern end of the Bosch, brought in a line, bearing S.W. by W. $\frac{1}{2}$ W. The channel, when past the beacon, continues to the southward of the island, with 10, 6, 9, 7, and 5 fathoms.*

* By a notice, dated Amsterdam, September 5th, 1842, the Born Reef having extended, from time to time, farther and farther to the N.E., the entrance of Zee Gat of Ameland has become so narrow, that its navigation is considered dangerous, and the red buoy marking the entrance, has been taken away. The grain mill at Ballum, on the island of Ameland, which used to serve as a sea-mark, has recently been broken down, and is no more to be depended upon.

At the east end of Ameland is a narrow passage, called the *Pinke Gat*, dry at low water, and only used by small coasting vessels.

VRIESCHE GAT has its entrance in latitude $53^{\circ} 32'$. Without the bar, in about 5 fathoms, is a fairway red buoy, lying with the village church, in *Schiermonnik Oog*, bearing S. $\frac{3}{4}$ E., distant nearly $4\frac{1}{2}$ miles. Within this buoy, the channel is marked out by black buoys on the western or starboard side, and white buoys on the eastern, or port or larboard side. The first three black buoys lie nearly in a line, bearing S.W. by S., and the first three white buoys nearly in the same direction; the third black buoy lying about W. by S., a mile from the third white buoy. The bar is $1\frac{1}{2}$ mile broad, having over it generally about 2 fathoms at low water. About 2 miles from the third white buoy, nearly in the direction of the first 3 buoys, is the fourth white buoy, where the channel is more than $\frac{1}{2}$ a mile broad, and the depth 5 fathoms mid-channel, whence it turns more to the eastward, and has a fifth white buoy on the port or larboard side, about a mile from the fourth buoy, opposite to which is the fourth black buoy. The channel now continues, in a S.E. direction, to the seventh black buoy, continuing thence S.W. by S., with two white buoys on the port or larboard side, into the passage, called the *Slenk*, leading up to *Groningen Diep*.

SCHIERMONNIK OOG, or ISLAND, is low and narrow, and is now only about 3 miles long, the eastern part being covered by the sea.

ROTTUM.—E. $\frac{1}{4}$ S., 12 miles from the west end of *Schiermonnik Oog*, lies the island of Rottum, on the western or starboard side of the entrance to the Western Ems. Between these is the *sandy flat* of Bosch, and several small channels running into the *Wadt*, &c.

The RIVER EMS.—There are three entrances to the River Ems—the Western Ems, the Eastern Ems, and the *Homme Gat*; these two latter being separated at the beginning by the *Juister Reef*.

The Western Ems has on its western side, the Island of Rottum, *Huiebert Plaat*, and other adjacent sands; and on the eastern side, the *Borkum Reef* and Island, the *Randzel*, &c.

The remains of Rottum is a small island, now not a mile in length. On it are two beacons and a house. *Borkum* is $2\frac{1}{2}$ miles in length, lying E. $\frac{1}{4}$ S. and W. $\frac{1}{4}$ N., and about $2\frac{1}{2}$ miles broad, being nearly divided, midway, into two parts. It now has two beacons and a lighthouse upon it. The light is illuminated with 27 lamps, being 150 feet above the surface of the sea, and visible more than 6 leagues off, in clear weather. From *Borkum* runs an extensive reef, full $6\frac{1}{2}$ miles to the north-westward; and this sand properly divides the entrances of the Western from the Eastern Ems. *Huiebert's Plaat* is a shifting sand, which must be left on the starboard side. Between *Borkum Reef* and the *Huiebert Plaat* is the *Geldzak Plaat*. *Hoorborn Sand* lies a little beyond *Huiebert's Plaat*, and extends toward the *Uithuizer Wad*. The *Randzel* is a large bank, to the south-eastward of *Borkum*, forming the north-eastern boundary of the Western Ems, as well as part of the western and southern limits of the Eastern Ems. The Eastern Ems is bounded on the west side by the *Borkum Reef*, *Brower's Plaat*, and *Randzels*; and on the east side, by the *Juister*, *Memmert*, *Kopor*, *Homborg*, and *Schuite Sands*. The *Homme Gat*, as before observed, is only divided from the Eastern Ems by the *Juister Reef*.

The WESTERN EMS.—The entrance to the Western Ems is between two banks, called the *Geldzak Plaat* on the north, and the *Huiebert's Plaat* on the south side. The first, or outer buoy, is black, and lies in latitude $55^{\circ} 36\frac{1}{2}'$, $13\frac{1}{2}$ miles E. $\frac{1}{4}$ S. from the red buoy at the entrance of the *Vriesche Gat*, its marks being the two beacons on Rottum in one, bearing S. $\frac{1}{4}$ E., and the southern beacon on *Borkum* in a line with the lighthouse, S.E. by E. From this, a white buoy, on the S.E. end of the *Geldzak Plaat*, bears E.S.E., distant $1\frac{1}{2}$ mile. Half a mile from the *Geldzak buoy*, a black buoy, called the *Dremple*, lies nearly south. Between these is the entrance; but keep rather to the north side, where you will have from 3 to $3\frac{1}{2}$ fathoms at low water. After having passed these buoys about $1\frac{1}{2}$ mile on an E.S.E. course, you will be in the main stream, with about a depth of 8 fathoms, where the channel is buoyed, with black buoys on the western, and white buoys on the eastern side. Proceed in this channel S.S.E. and S.E. by S., 5 miles, when you will be S.W. of the black buoy of the Inner *Hu-*

bert, with the Borkum lighthouse bearing N.E. by N. Here the channel is about a mile wide, on blue clay, with shells and stones.

S.E. by S., nearly 2 miles beyond the Inner Huiebert buoy, lies the N.W. end of a *middle ground*, called the *Meenwen Staart*, extending thence S.E. by S., $4\frac{1}{2}$ miles, having a white buoy near each end, and one on its S.W. side between them, all of which are to be left on the port or larboard side, five black buoys being on the starboard side of the channel. In this part of the passage you will have 10, 7, 8, 6, 8, and 10 fathoms water. You must be careful to avoid going to the eastward of the first white buoy of the Meenwen Staart, by not bringing the Borkum lighthouse to the northward of N. by E., as the tide of flood sets strongly over that sand; but if the lighthouse cannot be seen, you may borrow on the west side of the channel by the lead, but not going into less than 6 or 7 fathoms water.

The *Ems Horn* is another *middle*, lying 3 miles to the south-eastward of the east end of the Meenwen Staart. On its east side are 3 black buoys, to be left on the starboard side in going up. It is narrow, but about $3\frac{1}{2}$ miles long. On its western side is a passage, called the *Docke*, at the entrance of which is a black buoy; but, as the flood-tide sets strongly through, it is to be carefully avoided. The course from the buoy on the east end of the Meenwen Staart, to abreast of the first buoy on the east side of the Ems Horn, is E.S.E. $\frac{1}{4}$ S., and distant nearly 5 miles; when a S. by E. and south courses will carry you to the third black buoy. Having passed this buoy, steer more westerly, between that and a white buoy on the north end of the Hond, leaving the latter on the port or larboard side; a south-westerly course will then lead you to the Road of Delfzyl. In this passage you must not approach the Ems Horn nearer than 5 fathoms, as it is steep-to, and should be carefully avoided; for, in this part of the river, the streams of the Eastern and Western Ems unite; so that, if a vessel were to ground here, she would probably be lost.

Beyond the Ems Horn are two *middle grounds*, called the *Hond* and the *Paap*, which extend 5 miles in a S. by E. direction, and are steep-to. The western side bends circularly parallel to the western shore, having between them, in mid-channel, from 9 to 6 fathoms at low water; but you should not advance on either side into less than 5 fathoms. When a windmill, seen over the town of Delfzyl, bears S. $\frac{3}{4}$ W., it will lead you clear of the western edge of the Paap, until you open the haven of Delfzyl, whence you may keep over towards the eastern shore, in 6, 7, to 5 fathoms. In the mid-channel there are 8, 9, and 10 fathoms, with soft sticky ground. Now steer E.S.E., leaving the white buoy, on the S.W. end of the Paap, on the port or larboard side; keep on this course, or rather more easterly, until you arrive near the point called the *Hoek van de Knok*, from which a breakwater projects out, with a swinging beacon, altogether about 3 cables from shore. At $\frac{1}{2}$ a mile S. by E. from the Hoek there is a black buoy, pointing out the extremity of the Wiebelsummer Plaat, which is to be left on the starboard side; then, by keeping near the shore, you may, with the tide, reach the road before Embden, where a vessel, not drawing more than 12 feet, may conveniently lie off the town.

The EASTERN EMS.—In making for the Eastern Ems, bring the great beacon upon Borkum, in one with the light tower; keep them thus, until in 8 or 7 fathoms, where you will find the first, or outer black buoy, in latitude $53^{\circ} 40\frac{1}{4}'$, the light-tower and beacon bearing S. by E., distant 6 miles from you.

Emden, March 7th, 1843.—The Hydrographic Administration of this port, on the 5th instant, notified the following:—In order that mariners entering the River Ems may, at the outermost buoy, have a certain mark, to ascertain whether they are before the mouth of the Western or Eastern Ems, it has been determined that, from the present date, there will be laid down, at the mouth of the Eastern Ems, a large black buoy, pointed at both ends, in the form of a ship's anchor-buoy. The situation of this buoy in every other respect, however, is to remain unaltered, at 8 fathoms, low water mark, the light tower on Borkum a little westerly of the Great Kaap of Borkum.

The channel of the Eastern Ems is regularly buoyed with black buoys on its western, and white on its eastern side. The first white buoy bears from the outer black buoy E. by S., rather more than 2 miles distant. It lies in 5 fathoms, the ground between them being soft and sticky. The second black buoy, in $5\frac{1}{2}$ fathoms, lies S.E. by E., $1\frac{1}{2}$ mile from the outer buoy; and W.S.W., a mile from the first white buoy, the channel between having a depth of $6\frac{1}{2}$ fathoms. The third black buoy, called the *Middel*,

bears from the second S.E. by E., $1\frac{1}{2}$ mile; and the fourth from the third S.E., $1\frac{1}{2}$ mile, nearly. The second white buoy lies on the eastern side, a little below the fourth black buoy, in $5\frac{1}{2}$ fathoms. The channel here is S.E., with the flood running in the same direction; and the depths are from 6 to 7 fathoms. From the second white buoy to the third, which lies on the S.E. end of the Juister Reef, the course is S.E. $\frac{1}{2}$ S., and the distance $2\frac{1}{2}$ miles. This latter buoy has lately been changed for a buoy pointed at both ends, like a ship's anchor-buoy, and striped black-and-white. Opposite to this striped black-and-white buoy, is the fifth black buoy, or Middel Brower, in 4 fathoms, bearing from it W. by N., a mile. Having passed these buoys, you will enter into the main stream of the Eastern Ems; and when you arrive at the sixth black buoy, or Binnen Brower, will have crossed the bar, with $3\frac{1}{2}$ fathoms, where the two beacons on the eastern extremity of Borkum will appear in a line. About a mile eastward of the Binnen Brower black buoy, a new white buoy has been laid down, on the edge of the Rachelot Plaat, to be left on your port or larboard side going in. From the bar, the direction of the channel is S.E. $\frac{1}{2}$ E.; and its breadth, for 4 miles, more than a mile, with 8 to 11 fathoms, 3 black buoys marking the western side. It thence is contracted by a bank on that side, called the Konings Plaat, to less than $\frac{1}{2}$ a mile, where the third black buoy, or Konings Ton, appears in the middle of the river, 5 miles above the Binnen Brower buoy. About $\frac{3}{4}$ of a mile S.E. by E. $\frac{1}{2}$ E. from the Konings Ton, a white buoy has been placed on the Rosser, or Koper Sand, to be left on your port or larboard side going in. Below the Koning's Ton, or King's buoy, is a roadstead, with a depth of 10 fathoms.

At 2 miles from the Konings Ton is the Kaap Ton, which is red, the course up being S. by E. and south, with 10 to 6 fathoms. You now arrive at a narrow part of the channel, called the Wester Balg, the water there being shoaler. The Wester Balg has two black buoys on the western, and three white ones on the eastern side, the second black buoy being called the Randzel. This channel is less than $\frac{1}{2}$ a mile in breadth, with $6\frac{1}{2}$ to 3 fathoms in it. The mark through, as far as the Randzel buoy, is the spire-steeple of Holwierda, which is situate a little below Delfzyl, just touching a small wood, called the Wood of Watrum, on the west side, bearing S.S.W. $\frac{3}{4}$ W.; but this mark continued, will lead over the bar, at the termination of the Wester Balg, where there are only 6 or 7 feet at low water; you should, therefore, make for the fairway white buoy on the Balg, which you may pass on either side, in 12 or 14 feet; from whence you may proceed by the Ems Horn to Embden, as before directed. Allowance must always be made for the stream of tide, the flood setting strongly upon the Randzel Sand, below the Konings Ton, and the ebb on Browsers Plaat and the Juister Reef.

THE HOMME GAT.—This passage into the Eastern Ems lies between the Juister Reef on the west side, and the Schaape Sand on the east side, and is nearly a mile in width. On the north side of this sand is a red buoy, lying at some distance eastward from the entrance, with the two beacons on the eastern end of Borkum in a line, distant $6\frac{1}{2}$ miles.

Vessels bound into this Gat from the westward, should not approach nearer to the Juister Reef than 8 to 6 fathoms, until they bring the Borkum light-tower to bear S.W. by S.; being then on the west side of a round rugged down, called Kat Duyn, which is very conspicuous, and leaving the spit of the Schaape to the northward, should approach a white buoy on the west side of that sand, keeping it on the port or larboard side: here the depth will be about 4 fathoms. S.S.W. $\frac{1}{2}$ W., 2 miles from the white buoy, is a black beacon-buoy, in about $5\frac{1}{2}$ fathoms, on the eastern edge of the Juister Reef. Rather more than $1\frac{1}{2}$ mile S. $\frac{1}{2}$ W. from which, is the Binnen striped black-and-white buoy, already mentioned, on the S.E. end of the Juister. Having passed this, you will enter into the main channel, and may proceed S.E. $\frac{1}{2}$ S., $4\frac{1}{2}$ miles, to the Konings, or King's buoy. Leaving this on the starboard side, you may continue to Embden, as before directed.

The above instructions are to be used only in cases of necessity; for it will always be advisable to take a pilot for the Ems. The buoys are also frequently removed during the winter; and the tides commonly run in with great velocity.

There is a remarkable *flat of soundings* to the northward of Borkum Reef, which stretches out full 7 leagues, and has $1\frac{1}{2}$ and 2 fathoms less water over it than in the surrounding sea, the bottom being composed of coarse sand, yellowish red stones, and

[NORTH SEA.]

shells of a dark colour, between red and yellow. Vessels bound to Heligoland, will do well to gain the above spot, by which they may ascertain their distance, which, from Heligoland, is about 19 leagues.

To the eastward of the Ems lie the islands Juist, Norderney, Baltrum, Langer Oog, Spiker Oog, and Wanger Oog, all low sandy islands, fronting the main, having channels both between each other and the shore. These channels open a line of communication all the way from the Texel to the Ems, and from the Ems to the Jahde and Weser; but they are only navigable by small craft, and known exclusively by the natives.

WANGER OOG is distant from Borkum about 44 miles. It is a small narrow island, lying near the entrance of the rivers Jahde and Weser, having a sandy shore, so low, that the tide frequently overflows it. Upon it is a church and a lighthouse. This lighthouse stands, according to the latest survey, in latitude $53^{\circ} 47' 30''$ north, and longitude $7^{\circ} 51' 55''$ east from Greenwich. It is built of bricks, in form of a column, and supports a lantern, 67 Hamburg feet (about $63\frac{1}{2}$ English) above common high water mark, in which there is an intermitting lamp-light, alternately visible and invisible for the space of a minute, and is thus distinguished from the neighbouring lights of Borkum, Heligoland, Neuwerk, and Cuxhaven.

On board ship, supposing the eye to be 9 feet above the level of the sea, the light may be seen at the distance of 12 miles; and, consequently, becomes visible from the westward, when opposite the East Friesland Island of Langer Oog; from the northward, when midway between Heligoland and Wanger Oog; from the eastward, when near the light-vessel before the Weser, where the light of Neuwerk likewise begins to appear; and from the southward, when on any of the flats below Wanger Oog.

The lighthouse stands E. $\frac{1}{4}$ N., or north, 88° east by compass, distant 1750 feet from the high tower with three pinnacles, which is situated on the western part of the island of Wanger Oog, and discernible, as a day-signal, at a considerable distance at sea.

HELIGOLAND is a small island, flat, but elevated, lying directly in front of the rivers Jahde, Weser, and Elbe. It may be seen, in clear weather, 6 or 7 leagues off, and has a good lighthouse upon it, 250 feet above the level of the sea, which is lighted constantly throughout the year. This is the object vessels generally make, when bound for the Elbe or Weser; and here pilots are to be found for both rivers. To the eastward of Heligoland is a small sandy island. Both these islands are surrounded with *dangerous reefs*, running chiefly to the northward. South-eastward from Heligoland is the *Klip*, or *Steen Rock*, upon which a buoy is placed; but as this buoy may, in stormy weather, be driven from its position, it will be advisable to attend to the marks for it, which are, the two beacons on Sandy Island in one, and the lighthouse in a line with a wooden beacon on Heligoland. Off the south end of the island is a remarkable sharp broken point of land, called the Monk. Heligoland lighthouse is in latitude $54^{\circ} 11' 20''$ north, and longitude $7^{\circ} 53' 13''$ east from Greenwich. It bears from Yarmouth east, distant 79 leagues; from the Spurn Head E.S.E. $\frac{1}{4}$ E., $92\frac{1}{2}$ leagues; from Flamborough Head E.S.E., 92 leagues; from May Island, off the Brith of Forth, S.E., 126 leagues. Vessels intending to anchor in the road of Heligoland, which certainly is not to be recommended, on account of the rocky nature of the ground, and the little security to be found there, should, if intending to enter by the northern passage, bring Heligoland to bear S.E., and proceed in that direction, until the island is about a mile distant: but be careful not to lose sight of the new lighthouse lantern, or observe to discern the top of the old lighthouse over the cliff; and, in the night, keep the light in sight just above the cliff. When the north point of Heligoland bears south, or the beacon in the lower town is open of the cliff, you may run in; or, at night, when the light bears S. by E. $\frac{1}{4}$ E., you may bear-up for the anchorage, always taking care that the light be not obscured by the cliff. Keep your lead constantly employed, and come not nearer to the downs than 4 fathoms. In mid-channel there are 6 and 7 fathoms. The best anchorage for large vessels is to the eastward of the downs. Over the bar, abreast of the town, are only 2 to $2\frac{1}{2}$ fathoms at low water.

THE RIVER JAHDE runs in between Wanger Oog and the Mellum Sand. It is buoyed throughout, the sands which line the shore forming its western boundary, while the extensive shoals of the Hoher Weg are to the eastward, and divide it from the Weser. These sands have many swashways, or channels, through them, which can be passed by boats. The outer buoy of the Jahde is striped black-and-white, and

marked on its upper side with a crown, and "Jahde," and lies in $4\frac{1}{2}$ fathoms, with Wanger Oog lighthouse S.W. $\frac{1}{2}$ W., distant $3\frac{1}{2}$ miles; Minsen Church S. $\frac{1}{2}$ W., $8\frac{1}{2}$ miles; and the outer black buoy on the Plaat S.S.E., $1\frac{1}{2}$ mile: from this latter buoy, Wanger Oog lighthouse bears W. by S. $\frac{1}{2}$ S., $3\frac{1}{2}$ miles. The entrance lies between these two buoys, and runs in a south-easterly direction for $3\frac{1}{2}$ miles, leaving 4 black buoys on your starboard hand; then south to a fifth black buoy; afterwards, a S. by W. course will take you up the Jahde, leaving the white buoys on your port or larboard hand. The channel is nearly 2 miles wide; but becomes narrower as you advance.

The following official notice is dated Oldenburg, June 4th, 1844:—

"The course of the Jahde is marked, at present, by twelve buoys, of which, seven lie behind the Wanger Oog and the Minsen Olde Oog, and five in the Upper Jahde, from Hooksiel, as far as the Abrahamh Felds, viz.:—

"Of these buoys, the one marked "Jahde," will remain moored during the winter; the buoys 2 to 7 will be replaced in the beginning of November, by Bogin; the buoys 8 to 12 will then be removed altogether. All the buoys removed in November, will be replaced in the spring, as soon as the weather permits it.

"In order to cover the expenses of these buoys, a tonnage of 8 groschen (gold) for each oat last of the burthen of a vessel entering the Jahde, will be levied. Such tonnage must be paid to the receiver appointed by the bailiesship of Minsen, by all vessels of five oats last and upwards, whether they seek a place of refuge or freight, or to discharge their cargo, if they come to an anchor in the Jahde, south of the black buoy E, sub. No. 7, or if they visit a port or creek of the Jahde. Each vessel will, however, only once a year be liable to pay tonnage.

"All bailiesships bordering on the Jahde, are hereby ordered, at the request of the lawful receivers of such tonnage, to assist in levying it in the same manner as other public taxes, and to decide, in cases of dispute, according to the foregoing regulations. From the decision of such bailiesship, an appeal can only be made to the Government."

Signed, { MUTZENBECHER.
BOCHOLTZ.

THE RIVER WESER is formed by the Mellum and Hoher Weg to the westward, and the Tegeler's Plaat, and numerous other sands, to the eastward, having its entrance divided into two channels by a *sand-bank*, called the *Noord Plaat*; of which, the westernmost is considered the fairway, and is regularly buoyed, in the following manner:—

The first, or outer buoy, lies in $10\frac{1}{2}$ fathoms, and is black, with a gilt key upon it, and therefore called the Schlüssel, or Key buoy. It lies 6 miles N.E. from the light-tower on Wanger Oog, and $2\frac{1}{2}$ miles S.W. by W. from No. 1 white buoy.

The second black buoy, called the Birn, marked with an "A," has a small spar, with a gilt spear on it.

The third black buoy is marked "B."

The fourth black buoy, "C," and has a gilt cross on it, at which the tower of Wanger Oog will bear from you W. by S., distant $7\frac{1}{2}$ miles. The course from the first to the fourth black buoy is S.E. by E. $\frac{1}{2}$ E.

The fifth black buoy is marked "D;" the sixth black buoy "E," and the seventh black buoy is called the Mellum, marked with an "F;" it has a small spar, with a flag on it, at which Wanger Oog will bear W. by N. In 1818, a floating light-vessel was placed between the Tegeler's Plaat and the Mellum, in the fairway of the channel. This vessel is moored nearly a mile to the eastward of the eighth black buoy, in 8 fathoms water, at the making of the flood-tide, and is on no account to quit its station, unless forced so to do by the ice. The light-vessel has two masts—a large and a small one. During the day, a red ball is hoisted at the top of the main-mast; and this, at night, is replaced by 7 lantern lights round the mast, 28 feet higher than the deck, which will be visible, in clear weather, full 3 miles. The bearings from the light-vessel are, Heligoland N. $\frac{1}{2}$ W.; Wanger Oog light-tower W. $\frac{1}{4}$ N.; Minsen Church S.W. by W.; and the Bremer beacon S. by E. A ship bringing the light to bear S. by W., should steer directly towards it, when intending to enter the North Weser.

The eighth black buoy is marked "G;" the ninth black buoy, "H;" the tenth black buoy, "I;" the eleventh black buoy, "K;" and the twelfth black buoy, "L." The buoys I, K, and L, lie on the edge of Schmidst Steert; and from L, the Bremer

con, which stands on the N.E. part of the Hoher Weg, bears S. by E. $\frac{1}{4}$ E., distant $2\frac{1}{2}$ miles. From this buoy to the thirteenth, which is marked with an "M," called the Haller's buoy, the course is S.S.E., $1\frac{1}{4}$ mile; and from this to the fourteenth, marked with an "N," and called the Ashler's buoy, which lies before the highway, the course is S. by E. $\frac{3}{4}$ E. On the eastern side of the channel is the Kreuts white buoy, marked "No. 7," bearing from the Bremer beacon S.E. $\frac{3}{4}$ E., $3\frac{1}{4}$ miles; whence you may proceed to Fedderwarder or Blexum, by the chart, passing the black buoys on the star-board, and the white ones on the port or larboard side, where you may obtain a pilot for Bremen.

A second light-vessel is now placed near the entrance of the Wurster Channel, marked "Weser, No. 2," and will remain there moored, annually, as long as the navigation is free from ice. This vessel lies S. by E. $\frac{1}{4}$ E., $7\frac{1}{4}$ miles from the No. 1 signal-ship. Ships coming in from sea without a pilot, must pass near, and on the west side of the light-ship No. 1: then immediately bring her to bear N. $\frac{1}{4}$ W.; keep her so, steering southerly for 3 miles. At this distance, the light-ship No. 2 will bear S.S.E.; then steer directly for it, passing it on the east side; then steering S.E., keeping the light-ship N.W. for about a mile; then come to an anchor, at low water. Without a pilot they should not proceed farther. Both light-ships are painted red, and their lights 42 feet above the water, and carry a red ball at their mast-heads.

Opposite to Blexum is Bremerlehe, where a new harbour has been constructed, at the mouth of the River Geest, under the appellation of Bremer Haven, and is now open for the admission of vessels bound to that place. A plan is in contemplation, to cut a canal from Gerslendorp, to be navigable for ships of the largest dimensions, through the Hanoverian territory, to join the River Elbe. The practicability of the undertaking has been considered, and undertaken; by which a great advantage is anticipated to the commerce of Hamburg.

Between the Dopp Kreutz buoy and the white buoy, No. 8, is the entrance of the Eastern Channel. It lies between the Wurster Watt and Lang Lutzen Sand. It first runs in about E.S.E., and changes to S.E. and south. It has a red buoy at the entrance, to show the fairway, and is regularly buoyed and beacons, having the black buoys, &c., on the south and west, and the white buoys, &c., on the opposite side.*

The RIVER ELBE lies to the eastward of the Weser; the outer black buoy, or Schlüssel Ton, of the Weser, bearing from red buoy of the Elbe W. $\frac{1}{4}$ S., $16\frac{1}{4}$ miles; and the red buoy of the Elbe bearing from Heligoland S.E. by S., distant nearly 20 miles. The channel towards Cuxhaven is bounded by the Schaarhorn Sands and Neuwerk Island to the southward, and by the Vogel Sands and North Grounds to the northward, forming a passage in some places scarce $\frac{3}{4}$ of a mile wide. From Cuxhaven, the river runs E.S.E. and S.S.E. toward Gluckstadt; about S. by E. to Stade; and then more easterly toward Hamburg: the distance from the red buoy to Cuxhaven, being 15 miles; from Cuxhaven to Gluckstadt, 26 miles; from Gluckstadt to Stade, 10 miles; and from Stade to Hamburg, 18 miles. The channel throughout is buoyed with black and white buoys: the black buoys are to be left, in going in, on your star-board side, and the white on your port or larboard side. On the Neuwerk Island are two lighthouses and two beacons; and on the Schaarhorn is another beacon. Besides these, are other buildings on the Neuwerk; but only the above beacons and lighthouses can be seen at sea.

The red, or outer buoy of the Elbe, lies with the Schaarhorn beacon and Neuwerk great light-tower in one, bearing about S.E. by S.

The first black, or Great Kettle buoy, is marked "A," and has Schaarhorn beacon bearing S. by E. $\frac{1}{4}$ E.

The second black, or Little Kettle buoy, is marked "B," and lies in 9 fathoms water, so that you may see the western house mid-way between the lighthouse and barn, Schaarhorn beacon bearing S. by W., and Neuwerk lights bearing S. by E. $\frac{3}{4}$ E.

The third black, or Schaar buoy, is marked "C," and lies in 8 fathoms, Neuwerk great light-tower bearing S. by E. $\frac{1}{4}$ E., the tower being in one with the northern beacon.

The fourth black buoy is marked "CC," lies a mile S.S.E. $\frac{1}{4}$ E. from the Schaar

* Bremen, October 24th, 1845.—The three beacons on the Ewer Sand have been washed away.

buoy, Neuwerk great light-tower bearing S. by E., and open to the eastward of the low tower and north beacon.

The fifth black buoy, marked "D," lies off the Hunde Ballje, the great light-tower bearing south, a little easterly, and the buoy, CC, N.N.W $\frac{1}{2}$ W., distant a mile.

From the red buoy to the Great Kettle buoy, the distance is $1\frac{1}{4}$ mile E.S.E. $\frac{1}{2}$ E.; from the Great Kettle to the Little Kettle buoy, $1\frac{1}{4}$ mile S.E. by E. $\frac{1}{2}$ E.; from the Little Kettle buoy to the Schaar buoy, a mile S.E.; from the Schaar buoy to that marked CC, a mile S.S.E. $\frac{1}{2}$ E.; and from the buoy CC to that marked D, S.S.E. $\frac{3}{4}$ E., a mile.

The sixth, or black Lee buoy, is marked "E," and lies S.E. $\frac{1}{4}$ S., $\frac{3}{4}$ of a mile from that marked D, the great tower bearing S. $\frac{3}{4}$ W.

The seventh, or Flugel buoy, lies in $6\frac{1}{2}$ fathoms, S.E. $\frac{1}{4}$ S., $\frac{3}{4}$ of a mile from the Lee buoy, and is marked "F." It has a vane. The great tower is in one with the eastern house, bearing S.S.W. $\frac{1}{2}$ W.

The eighth black buoy is marked "G," and lies S.E. $\frac{1}{2}$ E., $\frac{3}{4}$ of a mile from the Flugel buoy. The ninth is marked "H," and lies $1\frac{1}{4}$ mile S.E. by S. from that marked G; the tenth is marked "I," the eleventh "K," and the twelfth "L." These last four lie in a line nearly S.E. $\frac{1}{2}$ E.; and from H to L is nearly $4\frac{1}{4}$ miles. K is called the Bosch buoy. The buoy marked L, lies N. $\frac{3}{4}$ W., nearly 3 miles from the lighthouse at Cuxhaven.*

These are all to be left on the starboard side in entering. On the port or larboard, or opposite side, are 7 white buoys, lying on the edge of the Vogel Sand and Sand Rift, and distinguished as follows:—

No. 1, the first, or outer buoy, in 7 fathoms. The Neuwerk light lies in a direct line with the great, or north beacon, so that the light which bears S. by E. $\frac{1}{4}$ E. is hid by the beacon.

No. 2 lies nearly a mile S.E. $\frac{1}{2}$ S. from the buoy No. 1. No. 3 lies $\frac{1}{2}$ a mile S.E. by S. from the buoy No. 2. No. 4 lies near the N.W. extremity of the Sand Rift, at the distance of $\frac{3}{4}$ of a mile S.S.E. from No. 3.

The buoys Nos. 5, 6, 6 F, and 7, lie along by the S.W. edge of the Sand Rift, No. 6 F being directly opposite the Flugel buoy, and distant from it $\frac{3}{4}$ of a mile. From No. 4 to No. 5, it is $\frac{3}{4}$ of a mile S.S.E. $\frac{3}{4}$ E.; from No. 5 to No. 6, a mile S.E. $\frac{3}{4}$ S.; from No. 6 to No. 6 F, $\frac{3}{4}$ of a mile S.E. $\frac{1}{4}$ E.; and from No. 6 F to No. 7, $1\frac{1}{8}$ mile S.E. by E. The buoy No. 7 lies with the great tower and black buoy G in a line, bearing nearly S.W. by W., distant from the latter $1\frac{1}{2}$ of a mile.

There are 5 additional white buoys, which point out the N.E. side of the channel to Cuxhaven. The first of these, No. 8, lies $1\frac{1}{4}$ mile from the buoy No. 7, and about $\frac{5}{8}$ of a mile N. $\frac{1}{2}$ W. from the black buoy J. The next, No. 9, lies $3\frac{3}{4}$ miles S.E. by E. $\frac{1}{4}$ E. from No. 8, and $1\frac{1}{2}$ mile north from the black buoy L. Between the two latter buoys, is a buoy numbered 8-9. The buoy No. 10 lies $1\frac{1}{2}$ mile S.S.E. $\frac{1}{4}$ E. from No. 9; a mile E. by S. from the black buoy L; and $2\frac{1}{4}$ miles N. by E. from Cuxhaven lighthouse. The buoy No. 11 lies $2\frac{1}{4}$ miles S. by E. $\frac{1}{4}$ E. from No. 10: this latter buoy lies $\frac{5}{8}$ of a mile to the eastward of Cuxhaven lighthouse.

By an official notice, dated Cuxhaven, April 30th, 1828, it appears, that two small buoys, each having a black vane upon it, were placed at the entrance of the River Ost, which is 11 miles above Cuxhaven, towards the Bellum Outer Dyke, where two wrecks had been sunk: but two large sea buoys, one black, the other white, still denote, as heretofore, the channel into the Ost River, where it falls into the Elbe. In autumn, and thence until spring, the channel at the entrance of the Ost River will be marked out only by common buoys; and these you are cautioned not to approach too near.

Since the 1st of August, 1844, a signal-ship has been placed below the Schulau, in the district of Luhr. The vessel, during the day, will show a red-and-white flag; and at night, hoist a lantern at her mast-head. She will be moored near the black buoy

* *Schulau*.—The Port-Deputation of Hamburg has made arrangements, that from the 1st of September, 1841, there shall be placed below Schulau, between the two black buoys, Nos. 9 and 10, south side of the channel, and north of the Portuguese ship, *Isabella*, sunk 2 years ago, a vessel, with a flag flying in the day-time, and a lantern at night, for the security of navigation.

—*Shipping Gazette*.

No. 10, with the Steinerherchen steeple, below Luhr, bearing W.S.W.; and the light-ship at Schulan S.E.

Besides the colour (which sometimes may be mistaken), the white buoys are distinguished from the black by their figure and form; the latter being conical, with their points under water; but the white having the shape of a long nun-buoy, with two points; the one above water, with a vane, the other under water, with an iron bar fastened to the chain, which keeps it erect, and makes it visible at a greater distance.

The continuation of the channel is pointed out by white buoys on the port or larboard side, and black ones on the starboard side; and the edge of the banks, on the starboard side, by white buoys also, all the way to Hamburg.

NORTH ELBE.—The channel of the North Elbe having become navigable, it was buoyed off, during the summer of 1844, by 2 black buoys on the N.E. side of the Vogel Sand, and 3 white buoys on the Trindleggrund and Gelb Sand. When coming in from the westward, the black buoys are to be left on the starboard, and the white buoys on the port or larboard hand.

Ships coming from the north, intending to use this fairway, may, from the yellow buoy of the southern pijp (sluice), steer S. by E. $\frac{1}{2}$ E. for the white beacon-buoy No. 1, keeping the last-mentioned on the port or larboard side; and from thence steer S.E. by E., till in the middle between the next white buoy before Trindleggrund, and the black buoy before the N.E. point of Vogel Sand, from where the course is S. by E. $\frac{1}{2}$ E., at the following bearings:—The ball-beacon rather easterly of the fire-tower at Cuxhaven, in order to pass between the other buoys and the white buoys, Nos. 8 and 9, in the Elbe. Coming from the westward, the white buoy No. 1 must be passed; but the outermost light-ship in the Elbe, before reaching the buoy, must not be left more northerly than west. In order to make sure of the fairway over the Dlaak, between Gelb Sand and Trindleggrund, a black buoy has been placed on the north side of the latter, in $2\frac{1}{2}$ fathoms water, at the following bearings:—The beacon on Schaarhorn S. 65° W.; the large tower of Neuwerk S. 34° W; and the ball-beacon S. $10\frac{1}{2}^{\circ}$ E. The ball-beacon is situated somewhat westerly of the light-tower of Cuxhaven; and the little light-ship in the Elbe, 1° west of the Schaarhorn beacon.—*Shipping Gazette, October 12th, 1844.*

Hamburg, February 28th, 1846.—Notice to Mariners.—The NORTH ELBE.—On the fairwater, north, round Vogel Sand. On the south side 2 black buoys, Nos. 1 and 2; and on the north side, 3 white buoys, A, B, and C, in the direction as specified in the notice of November 20th, 1844. The fairwater over the flats, between Gelb Sand (yellow sand) and Trindleggrund, has been marked by a floating beacon.

SAILING DIRECTIONS TO THE JAHDE, WESER, AND ELBE.

SHIPS coming from the westward, and passing the Texel at the distance of 4 or 5 leagues, will have from 14 to 18 fathoms, sandy ground; and steering E. $\frac{1}{2}$ N., may proceed toward Heligoland, in 15, 16, or 17 fathoms, until they have passed *Borkum Flat*. This reef may be known by the soundings off it, which, as before observed, are coarse sand, with small red stones, and shells of a dark red, or yellowish colour. There will be found about $1\frac{1}{2}$ fathom less water upon it than on either side of this flat. These soundings extend about 9 or 10 leagues toward the north and N.N.E., at the mean distance of 19 leagues from Heligoland. They are very remarkable, there being no other such on any other part of the coast; hence, every one ought to obtain them, in order to ascertain their distance from Heligoland, when sailing for the Elbe.

In hazy weather, or with northerly winds, vessels may keep farther from shore than above mentioned; and if, in this case, it be supposed that the vessel is within 7 or 8 leagues of the island, when in 17 or 18 fathoms, with soft muddy ground, it is recommended not to steer for it, as the reckoning may be deceptive; and it is likewise to be

observed, that 6 or 7 leagues to the northward of the island, there are soundings nearly similar to those off the shore to the southward, and also soft ground in the parallel of it. It is, therefore, particularly requisite, that navigators should be certain of having the soundings from the coast, or a good observation from the island; for the commanders of several vessels, neglecting this precaution, have supposed themselves to be off the coast, in 18 or 19 fathoms; and, having steered to the S.S.E., have gained 14 or 15 fathoms, with coarse sand and small stones; but, with these soundings, found themselves several leagues to the northward of the island. A proper allowance should, therefore, always be made for the operation of the tide, which otherwise will drive you considerably to the eastward of your reckoning.

Vessels bound for either the Jahde, Weser, or the Elbe, commonly make for Heligoland, its lighthouse being a good and permanent mark, burning all the year round; and, if necessity requires, they may anchor between it and the small sandy island; for the riding on the east side of the downs is good, with from 7 to 10 fathoms.

To the southward of the island, and near the shore, lies a *rock*, called the *Steen*, or *Stone* (before mentioned), which dries at low water, having a black buoy close to its west side, with the following marks, viz:—The lighthouse in one with the beacon on Heligoland, and the two beacons on Sandy Isle on with each other.

In order to avoid the Steen, in proceeding for the haven from the south-westward, care should be taken to keep the beacons on the Sandy Isle open of each other, until the lighthouse comes open to the eastward of the beacon on Heligoland. You may then proceed for the haven, and anchor, in 3 and 4 fathoms water.

When coming from the eastward, the lighthouse should not be brought on with the beacon on Heligoland. So soon as the northernmost beacon on Sandy Isle comes open to the westward of the southernmost one, you will be within the Steen, and may proceed for the haven.

In sailing along shore from the westward, for either the Jahde or Weser, an E. by S. course, making due allowance for the tide, will take you to the Schlusel, or outer buoy of the Weser; from whence, a S.S.W. $\frac{1}{4}$ W. course for a mile, will carry you to the outer buoy of the Jahde, which lies on the west end of the Jahde Plaat, and is striped black-and-white, to be left on your port or larboard side. This lies in $4\frac{1}{2}$ fathoms water. S.S.E., $1\frac{1}{4}$ mile from the striped buoy, lies the outer black buoy, at the entrance of the Jahde. This buoy, and also four other black buoys, lying in a south-eastern direction, on the northern edge of the Plaat, must all be left on the starboard side going in. These buoys are about a mile apart. Between the fourth and fifth buoys there is a white buoy, on the eastern end of the Jahde Plaat, which must be left on your port or larboard side. From the fifth black buoy, your course up the Jahde is about S. by W., till abreast of Hooksiel: then S. $\frac{1}{2}$ E. for about 3 miles; then S. by W. again, till you are above Heppens, where you can anchor, in $3\frac{1}{2}$ or 4 fathoms; but, as the sands up the Jahde often change their position, it will always be necessary to obtain a pilot. We have already noticed the lighthouse on Wanger Oog, which lies to the westward. There are no channels or harbours for ships between the Ems and Wanger Oog, the different channels between the islands being only fit for small craft.

The RIVER WESER.—Vessels from the Ems, and bound to the River Weser, should run along shore, in the depth of 12 or 11 fathoms, until they descrie the light-tower on Wanger Oog, when they may stretch along from that island, in the depth of 14 to 15 fathoms, across the entrance of the Jahde, till they come to the entrance of the Weser: then haul in to the southward, till they shoal their water to 10 fathoms, and Wanger Oog steeple bears S.W.; on which bearing, at the distance of 5 miles, lies the first black buoy, in 10 fathoms at low water, and has a gilt key on it, from which it is called the Schlusel, or Key buoy. A floating light has been established in the fairway, between the Tegeler's Plaat and the Mellum, near the eighth black buoy.

In November, 1840, a second light-vessel, marked "Weser, No. 2," was placed near the Bremer beacon, opposite the black buoy M, and $7\frac{1}{4}$ miles above No. 1 light-vessel.

But as it is customary to make Heligoland in running for the Weser, observe to keep a good look-out for the buoys. And great attention should be paid to your course in steering from Heligoland, either to the Weser or Elbe, as the tide is nearly on your broadside, both flood and ebb; and you may have occasion to steer $1\frac{1}{2}$ or 2 points on either side of the direct course, to hit the buoys.

If bound from Heligoland to the Weser, with a northerly wind, steer to the southward, until Wanger Oog comes in sight: then bring the island to bear S.W. $\frac{1}{2}$ W., but not farther west, before you enter the river; and, with that bearing, you will run close to the white buoy, marked No. 1, on the south side of the North Plaat.

Should it so happen, when between Heligoland and Wanger Oog, that the weather becomes thick and hazy, so that land cannot be seen, steer no nearer to the coast than in 13 fathoms, clayey ground. Here, with a flood-tide and fair weather, you may anchor; but with the ebb, keep under sail; for the flood will drive to the southward, and the ebb to the contrary.

Having made the Schlüssel, or Key buoy, you should steer E.S.E., $1\frac{1}{2}$ mile, to the second black buoy, remembering to leave all the black buoys to the starboard, and the white buoys to the port or larboard.

The black buoys are distinguished by letters, marked with white paint, and the white buoys numbered, in like manner, with black paint. Vessels may run up to either of them, so as to see their marks and numbers.

From the second to the third buoy, the course is E.S.E., $1\frac{1}{2}$ mile; from the third to the fourth buoy, S.E. $\frac{1}{2}$ E., $1\frac{1}{2}$ mile; and from the first, or outermost white buoy to the fourth black, the course is S.E. by S., $3\frac{1}{2}$ miles. Here, from the first to the fourth buoy, the flood sets strongly into the Jahde, and the ebb contrary. From the fourth black buoy to the light-vessel, No. 1, the course is S.E. $\frac{1}{2}$ S., $4\frac{1}{2}$ miles, passing 2 more black buoys on your starboard hand. From this to the second light-vessel, No. 2, the course is S. by E. $\frac{1}{2}$ E., $7\frac{1}{2}$ miles, leaving 6 black buoys on your starboard, and 5 white buoys on your port or larboard hand. From the light-vessel, No. 2, steer S.E., about a mile, and, at that distance, come to an anchor. Without a pilot, you should not proceed farther. From hence, the course of the Wurster Channel is S.E. by E., $4\frac{1}{2}$ miles; and to the Fedderwarder Channel, the course is S.S.E., about 5 miles, to the Sabzhorn bank, or buoy, marked "P."

A vessel, by bringing the light-vessel to bear S. by W., may steer directly for her, and pass to the eastward of the Noord Plaat, through the North Weser; but this passage, from want of buoys, is not recommended.

Vessels, at Heligoland, commonly engage a pilot for the Weser; but, having no pilot, you should steer from Heligoland S. by W., until you get sight of the church and lighthouse of Wanger Oog; bring the tower to bear S.W., and steer towards it: you will thus, in from 5 to 7 fathoms, get over the Noord Plaat, and come into the fairway of the Weser, where you see the white buoy, No. 1; from which you may steer on, leaving the white buoys on the port or larboard side, and the black ones on the starboard; and when you have advanced so far as the floating-light or beacon, you will meet the pilot-boat.

In case you should proceed from Heligoland, south, you may gain sight of the signal-vessel sooner, or about the same time that you see the light-tower of Wanger Oog; and then, wind and weather being favourable, you may steer the same course for the signal-vessel at the entrance of the Weser. It is better to bring her a point to the westward of south. But this passage is to be recommended only to vessels not drawing more than 8, 9, or 10 feet; and there being no buoys, you must, the more constantly, when westward of the Noord Plaat, keep the lead going; for on the east end of the Noord Plaat, are only 3 fathoms.

By far the greater number of ships, bound up the Weser, and coming from the westward, steer directly along the islands Baltrum, Langer Oog, Spiker Oog, so far as Wanger Oog, in the depth of from 11 to 12 fathoms. When you have made the tower of Wanger Oog, approach towards the shore, until you have 10 and 9 fathoms; then bring the tower to bear S.W., and steer N.E. to the Schlüssel buoy, where you will have a depth of $10\frac{1}{2}$ to 12 fathoms. If by night, the Wanger Oog light will be your best direction; you may then advance near enough to the Schlüssel Ton, or the white buoy, No. 1, to enable you to anchor on the S.W. side of the Noord Plaat, sheltered against a north or N.E. wind, until the break of day, when you may proceed on your way into the Weser.

In winter, with frost and ice, you must not enter the Weser, unless there is an almost certainty of reaching one of the harbours (Fedderwarder or Leher Hafer), where you may bring-up in safety. In this case, you must well observe, that if there are any

drifts of ice already formed, it may be possible, with westerly winds, to reach Fedderwarder, but not Lehe or Geestehaven; while, on the contrary, with N.E. or easterly winds, you have more chance of getting to Geestehaven than to the harbour of Fedderwarder. But, if time and circumstances do not allow you to sail into the Weser, you must take refuge at Cuxhaven or Heligoland, as deemed most expedient.

The RIVER ELBE.—Vessels sailing from Heligoland for the River Elbe, the entrance to which lies between the Vogel Sand and the Schaarhorn Reef, will steer S.E. by S. for the red buoy; but, with a flood and southerly winds, the course is S.S.E., and with an ebb and north-easterly winds, S.E. In running in the fairway for the red buoy, you will have 20, 17, 15, 14, 13, and 12 fathoms, soft clay ground, of a bluish colour, and at the red buoy, which lies in 10 fathoms, you will generally find fine yellow sand; but if, in your course from Heligoland to the Elbe, you happen to find a hard sandy bottom, of a reddish colour, you may be sure you are to the northward, and out of the fairway.

Great part of the vessels coming from the westward, and acquainted with the Weser and Elbe, do not sail to Heligoland, particularly with southerly winds. In this case, being arrived between Wanger Oog and Heligoland, and having the one or the other of these islands in sight, they steer, with an easterly course, directly for the Elbe.

The islands Wanger Oog and Heligoland bear N.N.E. and S.S.W. from each other, distant nearly 8 leagues. When midway between these islands, the direct course for the red buoy is E.S.E., distant 5 leagues; but allowance must be made for the wind and tide, the course with flood being S.E. by E., and with ebb E. by S., somewhat more southerly or easterly, according to the wind. In so steering, you will have 17, 15, 14, 13, and 12 fathoms, with soft bluish ground, as before observed. When standing towards the south shore, and coming into 10 fathoms or less, the bottom is hard fine white sand. But the sandy shore between the rivers Jahde, Weser, and Elbe, is very dangerous, because it is steep-to, from 10 to 9 and 7 fathoms, and then dry.

If it should be dark or thick weather, you must be careful not to approach nearer than 13 fathoms, and then, if it be flood-tide, anchor. With an ebb, you may, perhaps, keep under weigh until day-light, or until the weather becomes clear. Great attention to the winds and tides is necessary, observing that the flood sets northward and eastward, and the ebb westward and southward; and when near the entrance of the Jahde and Weser, in 12 fathoms, the flood sets into these rivers; but the ebb sets always to seaward. These currents are also stronger the nearer you are to these rivers, or to the passages between the sands.

It being a rule, that vessels should run into the Elbe and Weser with the tide, and always in the day-time, you will observe to regulate your approach to these rivers accordingly. The best guide for the entrance is the signal-vessel, which is stationed at the mouth of the river, a mile N.W. by N. from the red buoy, in 11 fathoms at low water, and 13 at high, having the great tower of Neuwerk, the Schaarhorn beacon, and red buoy in a line; and there moored with iron chains, and is not to leave her station in any stormy weather whatsoever, except when forced by the ice, in the winter season. This vessel most commonly leaves her station only in the months of January and February, but may be forced by the ice to leave sooner, and return later; as, on the contrary, she may sometimes, though seldom, happen to keep that station uninterrupted all the winter season. By being at the outer part of the entrance, and nearly 3 leagues to seaward from Neuwerk, she will easily be discovered by the approaching vessels, and distinguished by having three masts, with a red flag on the loftiest, which is also the mainmast. By night, she will exhibit a lantern-light 30 feet above deck; and, in a fog or hazy weather, when commonly no wind blows, she will, in every $\frac{1}{4}$ of an hour, ring a bell during 1 minute; or, if vessels coming in and being already in sight, should, by rain or snow, disappear again, the signal-vessel will fire guns from time to time.

Besides the above signal-vessel, the Admiralty pilot-galliot usually lies at anchor near the outer, or red buoy, when stormy weather or ice does not prevent it; out of which, all vessels that come from sea must take pilots. This galliot is chiefly known by a broad vane at the mast-head; and in the night it carries a small lantern at her stern. When the weather will not permit the pilot-galliot to keep her station off the red buoy, she used formerly to lie off the Flugel buoy; but as the channel there has shifted, a new one has been appointed for her when necessary, and she will no longer

[NORTH SEA.]

A A

proceed to the Flügel buoy, but will anchor within the triangle formed by the buoys D, E, and No. 6.

By a notice issued at Hamburg, September 24th, 1839, it appears, that a second signal-ship has been stationed to the northward of the white buoy, No. 4, near the Sand Reef, where the fairway divides. This vessel is distinguished from the outer, or first signal-ship, by having two masts. In the day, a blue-and-white flag, horizontally divided, hoisted at her mast-head; and during the night, showing two fixed lights, one above the other, 18 feet apart; and in foggy weather, a bell will be rung.

The course from the first to the second signal-ship is S.E. by E., distant $4\frac{1}{2}$ miles. Steer first E.S.E., 2 miles, then S.E. $\frac{1}{2}$ S. for the second vessel, which bears from the Schaarhorn beacon N.E.; and from the great Neuwerk tower N. $\frac{1}{2}$ W. She is moored in 11 fathoms water; and will keep her station from the 1st of October to the 31st of March, unless forced away by the ice. So soon as the arriving ships get near to the first, or outer signal-ship, they are to bring them in a line, and then steer as before mentioned, passing to the southward of the second vessel. By doing so, they will avoid the dangers of the Vogel Sand, Sand Reef, and Schaarhorn.

Having arrived at the second signal-ship, they must pass to the southward of it, and steer S.S.E. $\frac{1}{2}$ E., to avoid falling upon, or behind, the Sand Reef. After sailing about 3 miles, you will be near the Flügel buoy, the Neuwerk lights bearing S.S.W., where you will find a tolerable good roadstead; anchor there until day-light, when the buoys and marks will be distinctly seen, and a pilot-boat will meet you. Masters of vessels entering the Elbe in ice times, should be aware, that the signal-ships may be compelled to quit their stations, and run out to sea; in such cases there will be great danger, and the utmost caution required, to enter the Elbe; but if they should be under the necessity of doing so, they must pay particular attention to the directions given in this work.

The 2 buoys in the Northern Gat, between the Vogel Sand and Sand Rift, are black-and-white (quartered); No. 1 lies about 2 miles S.E. by E. $\frac{1}{2}$ E. from the inner light-vessel; No. 2 has a beacon on it, and lies E. by S. from No. 1, distant $1\frac{1}{2}$ mile. After passing the buoy No. 2, a S. by E. $\frac{1}{2}$ E. course will take you into the Elbe, between the buoys Nos. 8 and 9, to near the black buoy K, when you will be in the fairway for Cuxhaven.

The following notice of alterations have been issued by the Honourable Deputation of the Ports of Hamburg and the Elbe.—We recommend the study of this chart of the mouths of the Elbe and Weser, and making yourself well acquainted with the sights and positions of the sea-marks, the depths of the channel, the situations of the sands, balljes, and hollows, particularly that behind the Sand Rift, upon which several ships have recently been damaged; to avoid this middle ground, you ought constantly to keep your lead going, and to remain in the fairway, which lies more to the southward; also the Hundsballje and Kinderballje, which, by the flood setting inward, are apt to attract the ships, particularly when approaching it during a calm. It is the calms also which cause that thick and foggy air which obscures all sight of the buoys and marks; but, in general, with fair weather, the entrance to the Elbe is now made comparatively easy, by the liberal establishment of numerous sea-marks, lights, buoys, and pilot-vessels; yet, under the most favourable circumstances, there will always be some difficulties, which, however, an active and intelligent seamen will be able to overcome by proper care and attention.

To furnish the mariner with exact ideas of the above sea-marks, towers, lighthouses, and beacons, and also to prevent his mistaking one for another, they are exhibited upon the chart,* according to their form and measure, each at the side of the other; and those from Neuwerk are numbered, for their more accurate distinction, in the views or prospects of Neuwerk, where they are distinguished also by the same numbers as correspond with the plan. The situations and places from which Neuwerk is supposed to be seen, are also marked upon the chart, in Roman numbers, and are as follow:—

From No. I., the signal-vessel and red buoy, where Schaarhorn beacon and the great tower, or lighthouse, are on with each other.

From No. II., the gat, called Westertill, about 3 or $3\frac{1}{2}$ leagues distance from Neu-

* Chart of the Elbe and Weser, published by the proprietor of this work.

werk, where the great tower bears E. by S., Schaarhorn beacon $1\frac{1}{2}$ point to the northward of the tower.

From No. III., the gat north-easterly from the entrance of the Elbe towards the north of Vogel Sand, about 3 or $3\frac{1}{2}$ leagues distance from Neuwerk; the great tower bearing south, and Schaarhorn beacon $1\frac{1}{2}$ point to the westward.

The great tower of Neuwerk, and the Castle of Ritzbützel bear N.W. and S.E. from each other, the variation at this time being 20° west. Before Cuxhaven you will everywhere find good anchorage; but if obliged, by the ice, to run into the harbour, the best anchorage will be the Alte Liebe; and in case this harbour be already filled with shipping, you may go beyond the Schutshöft, upwards; and afterwards easterly, behind the said Höft, where you will obtain ample security against the ice.

The following directions were posted up at Lloyd's, 18th of April, 1844:—

*"Sailing Directions for the River Elbe.—First.—*Coming from sea with a northerly or N.W. wind, it is desirable to make Heligoland, before running in for the river. There is a light-vessel and a red buoy at the mouth of the Elbe, the former 18, the latter 19 miles S.E. by S. from Heligoland. The light-vessel has three masts, and is painted red, with "Elbe," in white letters, on her side. She carries a red flag at the main, by day; and, from sun-set to sun-rise, a single fixed light, about 30 feet above the level of the sea, and lies in 11 fathoms at low water; Neuwerk high tower, Schaarhorn beacon, and red buoy in a line, bearing S.E. by S., the latter a mile distant. Coming from Heligoland with the first of the flood, the course is S.S.E. to the light-vessel; with half-flood S.E. by S.; and with the first of the ebb S.E. You will then shoal the water gradually from 20 to 10 or 9 fathoms, with blue mud, very sticky. The tail of the Vogel stretches across the river in this direction; and you have more water after crossing it, and on getting nearer to the station of the light-ship. When the light-vessel bears S.E. by S., 6 miles, you will have 9 to 10 fathoms, very dark sand and mud; when bearing S.E., or S.E. by E., at the same distance, the bottom is blue mud, and occasionally muscle shells. The pilot-galliot, when weather permits, lies E.S.E., 2 miles from the light-ship, and E. by N., a mile from the red buoy, in 10 fathoms water. She is distinguished by a large red vane; and as long as there are any pilots on board, has the Hamburg Admiralty flag flying by day, and a light by night. Ships entering the Elbe, are required to hoist the usual signal for a pilot at the fore by day, and to show a light at night, when approaching the pilot-galliot, and to heave-to in sufficient time to enable a boat to come alongside, as near the galliot as practicable.

*"Second.—*In bad weather, when it is not practicable to board vessels at her proper station, the pilot-galliot removes to her inner station, nearer to Neuwerk. In such cases, ships will do well to attend to the following directions:—Pass to the northward of the outward light-vessel; then steer E.S.E., until the inner light-vessel bears S.E., or S.E. $\frac{1}{2}$ S.; then run direct for her, leaving her on the port or larboard side; then steer S.S.E., or S.E. by S., till you can get close to the black buoy E, when, if you do not find the pilot-galliot, you may anchor, in 6 fathoms. The buoys will be found to be a very good guide. In going in, leave the black on the starboard, and the white on the port or larboard side. The white, on the north side of the channel, are nun-buoys; the black, on the south side, are can-buoys.

*"Third.—*Coming in at night, when Neuwerk high light comes above the horizon from the deck, you will then be about 8 miles from the red buoy: bring it to bear S.E. by S., and steer for it. When the low light at Neuwerk is seen, you will not be far from the outer light-vessel: pass to the northward of her, and steer E.S.E., till the inner light-vessel bears S.E. $\frac{1}{2}$ S. This vessel has two masts, shows two fixed lights, one above the other, 18 feet apart, is painted red, with "Elbe" in white letters on her side, and carries, during the day, a horizontally-divided blue-and-white flag at the main. When you have brought her to bear S.E. $\frac{1}{2}$ S., steer directly for her. Leave her on your port or larboard side, and bring her to bear (directly after passing her) N.N.W. Then steer S.S.E., care being taken to keep the light-ship N.N.W.; and keeping a good lead going, you will shoal regularly from 18 to 6 and $5\frac{1}{2}$ fathoms, when you will be close to the black buoy E, Neuwerk light bearing S. by W.: take notice, however, before getting so far as this, you may probably get one cast of 6 fathoms on the tail of the Sand Reef which stretches into the channel. It is very narrow, and you deepen to

7, 8, and 9 fathoms again. When you make sure of having got soundings on the south side of the channel, near the black buoy E, in $5\frac{1}{2}$ fathoms, steer off to the N.E., in 6 or 7 fathoms, and anchor immediately. The channel is narrow here; and this is the inner station of the pilot-galliot, which carries a light by night, and will supply vessels with pilots that show a light, even at night, wind and weather permitting.

"Fourth.—It is advisable, with the wind to the southward of west, as soon as you have sounded on Borkum Reef, to steer easterly, along the south shore, in 13, 14, to 15 fathoms, till you reach midway between Heligoland and Wanger Oog; you are then W.N.W., 16 miles from the red buoy. Then steer E.S.E., and keep the lead going. On this course you will find 17, 16, 15, 14, 13, and 12 fathoms, with a bluish sticky ground. If too southerly, you will have 9 to 10 fathoms, sandy ground, and must then steer more northerly, till you regain the before-mentioned depth. As soon as you get sight of the high tower of Neuwerk, off the Schaarhorn beacon, or the outer light-vessel, bring the object S.E. by S., and steer this course, the lead constantly going, till you are certain you have reached the mouth of the Elbe; and then proceed, as stated in first and second.

"Fifth.—In coming towards the Elbe from the northward, keep the low light of Neuwerk open to the eastward of the high light, bearing S. by E. $\frac{1}{4}$ E. or S.S.E. You will then cross the tail of Vogel Sand, in 6 or 7 fathoms; and when you deepen to 10 or 12 fathoms, you will be then in the Elbe, and may proceed as before directed.

"GENERAL REMARKS.—When it is expected there is ice in the Elbe, whether these light-vessels are on their stations or not, it is not prudent for any ship to run into the river, unless there is a fresh wind at S.W. or west; as with these winds, and the tide at half-ebb, the channel is left free of ice; and ships may fully expect to get pilots and assistance, and to reach Cuxhaven harbour.

"Do not come nearer the Schaarhorn beacon than 9 fathoms; it is very steep.

"Do not trust to your soundings on the Vogel Sand, between the white buoy No. 2, and the station of the inner light-ship. The depth is very irregular; and being steep-to, from 13 to 14 fathoms, you are close to the dry sand. You may approach the Sand Reef to 5 fathoms on the south shore.

"In order to guard against mistaking the lights, which has often occurred, by mistaking the high light of Neuwerk for the light-vessel, it is recommended, as the only sure guide to strangers, when they see a light, to bring it to bear S.E. by S., before standing for it, and in that bearing, to steer direct for it. They will then, even if the light-vessel is away, come to no danger before seeing the low light on Neuwerk, and by that, know what light it is.

"With reference to the sailing directions in No. 4, it must be remarked, the south shore is very steep; and should, therefore, only be adopted when the wind is to the southward of west, taking care not to get to the northward of the Elbe, by striking, in hazy weather, the shoal water of the tail of the Vogel, (which stretches right across the Elbe) before sight of anything is got. Compass courses and bearings, and the distance 60 miles to a degree."

To sail into the Elbe at Night.

ALTHOUGH it is generally admitted, that vessels ought to sail in only in the day-time, and at night should not even approach the entrance nearer than 2 or 3 leagues, outside of the red buoy, in 13 or 14 fathoms, yet different circumstances may admit of exceptions to this rule. For instance, if a ship wants anchors and cables, or if forced, by hard stormy weather, to run in, or having a dangerous leak, &c.; or, suppose it to happen, after a warm summer day, when, by the rising of vapour, the air becomes hazy near the horizon, and prevents a distinct sight of the sea-marks, then the commonly following fresh and clear night gives a good sight of the lights of Neuwerk, by which a ship may sail in with more safety, perhaps, than at the high noon-day, when the horizon is so obscured by haze.

The high light of Neuwerk is elevated 128 feet above the surface of the sea, the lower one 64 feet; and they are 2100 feet distant from each other. The high light may be seen at the distance of 5 leagues, by an eye 16 feet above the sea; therefore, Heligoland light and that may both be seen about the same time.

Ships having the misfortune to run aground on the Vogel Sand, in stormy weather,

with west and N.W. winds, are generally lost, with both lives and cargo; whereas, under the like unhappy circumstances, at Schaarhorn Sand, the men, retiring to the beacon, are usually saved, and also some part of the cargo preserved. In all cases, there is good anchoring ground everywhere to seaward before the Elbe; and many a vessel, but scantily provided with anchors and cables, has been saved in a heavy N.W. gale, by cutting away the masts, and riding out the storm, when others sailing in, at the same time, were unfortunately lost.

The best time for going into the Elbe, wind and weather favourable, is about $1\frac{1}{2}$ or 2 hours after low water, when the tide begins to set right in; but, in bad and stormy weather, with westerly winds, it may be preferable to run in an hour before high water, since, by the extraordinary rise of the tide, caused by the strong sea winds, the vessel may pass over many sands and shoals without touching, which would be nearly dry at low water; besides, if unluckily running aground, she will not be exposed for a long time to the violent shocks upon the ground by the high seas and breakers. As to the clearness of the sight of the sea-marks on Neuwerk, the most suitable time for entering the Elbe in the summer season, is either early in the morning or in the afternoon, to avoid the beamy light which reflects from the air and water, and dazzles the eyes.

Times of HIGH WATER at the Full and Change of the Moon.

At Heligoland, at 11; at Borkum, at 30 minutes after 10; at Wanger Oog, Key buoy of the Weser, and red buoy of the Elbe, at 12; at Cuxhaven, at 1; at Blexen, at 30 minutes past 1.

TIDES.—The stream of flood from the Texel towards the Elbe and Weser, sets easterly; off Borkum Reef east, a little north; at Wanger Oog E. by S.; at Heligoland E.S.E.; at the entrance of the Elbe S.E. by S.; at Cuxhaven S.E.; and at the Key buoy of the Weser S.E. by S. The flood runs 6 hours; and the ebb 6 hours and 25 minutes. The current is never quite at a stand; it only changes its direction and force. The ebb, at the red buoy, sets at first S.W., then west and N.W., and at last northerly; and, in like manner, the flood runs gradually north-easterly, east, and then S.E., directly into the channel.

At Cuxhaven the ebb begins an hour later than at the red buoy, continues 6 hours and 45 minutes, and is then followed by the flood during 5 hours and 40 minutes. In the road, the current does not cease entirely; the flood continues running in $\frac{3}{4}$ or 4-5ths of an hour after the water's falling on the south shore. Between Cuxhaven and the mouth of the river, the velocity of the current is greater than outward at sea. In the channel, mid-tide ebb, when strongest, runs about 3 to 4 miles an hour, and with flood 2 to 3 miles an hour, according to the moon's age. On full and change days, the perpendicular rise of the tide is 11 feet, and on quarter days, $8\frac{1}{2}$ feet.

HELIGOLAND TO THE RIVERS EYDER, HEVER, WARDA, AND THE SCAW.

THE river Eyder lies to the north-eastward of the Elbe, and, like that river, is buoyed on both sides of the channel; but the sands so frequently shift their positions, that it will not be prudent to enter without a pilot. The outer black buoy of the Eyder lies E.S.E. $\frac{1}{4}$ E. from the Heligoland lighthouse, distant 22 miles; N.E. by E. from the red buoy of the Elbe, distant 13 miles; and E.N.E. from the Schlusssel, or outer buoy of the Weser, distant 29 miles.

A light-vessel, with one mast, is stationed at the entrance of the Eyder, between February and November. Besides being painted red, with a white streak, in the daytime a small Danish flag is hoisted at the fore-top, 60 feet above the water; and in the night a lamp-light is shown, at the height of 34 feet. When the vessel bears E. by S., it may be approached with safety. On board are pilots to convey you to Husum, Tonningen, and the Elbe. When, in thick weather, a cannon is discharged, or a bell tolled, they are signals to a vessel in sight, that she is taking a wrong course.

The channel to the entrance of this river is regularly buoyed, with black buoys on the starboard, and white buoys on the port or larboard side; beyond which, the courses in the different reaches, which are very circuitous, are pointed out by beacons on the edge of the sands, which are mostly dry at low water.*

CANAL.—For the purpose of facilitating the communication between the North Sea and Baltic, a canal is cut across the Duchy of Holstein, from the River Eyder, which passes by Rendsburgh, to about 3 miles north of Kiel, at the mouth of the River Lerwensawe. The Eyder is navigable more than 6 miles above Rendsburgh; and the distance, from the western sluice of the canal at Rendsburgh, to its commencement, near Kiel, is 20½ English miles.

The perpendicular fall of the canal, towards the Baltic, is 25 feet 6 inches; that towards the North Sea, 23 feet; and vessels passing through, are raised or let down by means of six sluices. The breadth of the cut is 100 feet at the top, and 54 at the bottom; the sluices are 27 feet broad, and 100 feet long; and the lowest depth of water is 10 feet. Merchant-vessels, of 120 tons, may therefore sail through this canal: and the distance from Tonningen to where the canal joins the Baltic, is 66 miles.

This canal was intended to facilitate the commercial intercourse between the towns of Bremen, Hanover, and Westphalia, which heretofore had been carried on by the Weser and Gluckstadt to Hamburg and Lubeck, and also to transport the merchandise of Holland and the North Sea to the Baltic; but the numerous shoals of shifting sand found between Rendsburgh and Tonningen, very much impede its expected success; and most vessels are inclined to prefer the old navigation round the Scaw into the Cattegat, with all its difficulties and dangers.

The North and South Deeps, leading to Busum, are also regularly buoyed out; and the outer buoy of the South Deep is a broad yellow buoy.

The RIVER HEVER lies to the northward of the Eyder, its outermost red buoy bearing from the outermost black buoy of the Eyder N.N.E., distant nearly 8 miles; but there are so many inlets and openings to go into along this coast, and the sand-hills on the different islands are so much alike in appearance, that no description is sufficient to guide a stranger. When, therefore, a ship is entangled, and unable to clear the coast, you must trust to the chart, wherein the several channels and sands are faithfully expressed. On seeing the breaks on these sands, you may form a good idea of their similarity; and knowing their situation, must steer in accordingly, anchoring as soon as you think your ship can ride; but should you perceive any sand outside of you, before you have touched the ground, or become leaky, you must push on for smooth water.

SMALL DEEP.—The entrance to the Small Deep is now marked out by a light-blue outer buoy, with a pole, on which a basket is attached: it lies in 4½ fathoms at low water, a mile without the No. I. black buoy. This channel is also regularly buoyed and beacons. Observe, the outer blue beacon-buoy lies with Sea Sand beacon N.E. ½ E., and Pillworm steeple E. ¾ S.

We have already stated that, for all these places between the Eyder and Horn Point, a pilot is indispensably necessary.

AMRON BEACON.†—"For the safety of vessels bound for the harbours or rivers in the neighbourhood of Heligoland, and carried by accident, or otherwise, to the northward of that island, a beacon has been erected on the sand-bank which lies 4 miles to the south of Amron, and to the north-west of the isle of Pillworm; and which, in ordi-

* The Director-General of Customs and Commerce has given notice, under the date April 25th, 1843, that, instead of the Eyder Channel, near the Kuller Sand, which has been found to be inaccessible to large ships, another channel, through the so-called Peter Carston's Lock, is to be substituted. The entrance to this channel is, coming from the south and north rock, near the black Steil buoy No 14, or the white buoy No 11. Besides these two buoys, there are also, as marks, on the south side of the Steil buoys Nos. 15 and 16, as also along and between both the buoys Nos. 14 and 15, several beacons; and on the north side of the white Steil buoys Nos. 12 and 13, at the shallowest part, between the black buoys Nos. 15 and 16, the water at an ordinary ebb-tide, does not exceed 6 feet. The course along this channel is N.E. and N.N.E. —*Tonningen Royal Pilot Inspectorate, May 11th, 1843.*

† The description of this beacon is here given from the original notice, as published by authority in Denmark. But it is to be observed, that it does not correspond, in several particulars, with our charts.

nary floods, rises 5 feet above the surface of the water. The height of this beacon is 60 feet. It may be seen at the distance of 12 miles; appearing at first like a sloop, with her top-sail set. From the light on Heligoland, the beacon bears N.E. by E. $\frac{1}{2}$ E., distant 25 miles.

"The advantages to be derived from this beacon are as follow:—First, it serves to point out the sand-banks in that part. So soon as it can be distinctly seen from the deck, the vessel should not approach nearer; for then the soundings will be from 6 to 5 fathoms, and the distance 8 miles. Second, the beacon serves also as an excellent mark for enabling vessels to regulate their course. When it is seen at the distance of about 8 miles, and bearing nearly east by compass, it gives the following magnetic courses and distances, regard being always had to the state and direction of the tide.

"To the island of Heligoland S.W., 18 miles; outermost red buoy of the Elbe, S. $\frac{1}{4}$ W., 30 miles; outermost black buoy of the Eyder S.S.E., 23 miles; outermost red buoy of the Hever S.E. by S., 12 miles; outermost black buoy of the Small Deep S.E. by E., $4\frac{1}{2}$ miles; Lister Deep N.E. by N., 35 miles.

"Third.—The beacon further serves as a particular mark for directing the navigation to these deeps and rivers.

"TO MAKE THE SMALL DEEP.—The beacon must be brought to bear N.E. $\frac{1}{2}$ E. from the vessel; and this course must be kept till within 4 miles of the beacon, where Pillworm old tower, bearing E. by S., the outermost black buoy of the Small Deep will be found in $4\frac{1}{2}$ fathoms. In clear weather, the beacon may be brought within $\frac{1}{2}$ of the compass to the east of the outermost corner of Amron, and the Pillworm old tower between North and South Oog (or Oye), but nearer to the first, in the proportion of one to two.

"TO MAKE THE HEVER.—Let the beacon be brought 8 miles to the east; then let the above-mentioned course (S.E. by S.) be kept till the North Hoft (or Head), that is, the N.W. part of the land of Eydersted, is seen E.S.E., or till the church and steeple or Wester Hever come clear of the Sand Downs; then the beacon, which can be distinctly seen, bearing north, the outermost red buoy of the Hever will be discovered.

"TO MAKE THE EYDER.—Let the beacon be brought 8 miles to the east, and let the course be S. by E. $\frac{1}{2}$ E., till the beacon disappears to the north. The Sand Down of Eydersted will then be discovered; and the course must be continued so long to the southward, in from 4 to $3\frac{1}{2}$ fathoms, till the two beacons on Sud Hoft, or at St. Peter, appear in a straight line, bearing E.N.E., when the outermost buoy will be seen.

"LISTER DEEP.—In the same manner the beacon is of advantage for making the Lister Deep; for so soon as it disappears to the south, the island of Sylt will be discovered; and when the middle of the island, called Roth Cliff, appears in the east, the course may be directed northward, very near the coast, till the point of it is reached; then hauling to the east and south-east, good anchorage may be found behind the Leist."

Directly opposite to Amron Island, and at about the distance of 10 or 11 miles, lies a *bank*, of $4\frac{1}{2}$, 5, and 6 fathoms water, stretching N.N.E. and S.S.W., 10 miles. It is commonly called *Amron Bank*. Its outer edge is steep-to, with 6 to 8 fathoms close to it, and within it are 6 fathoms, the depth decreasing gradually toward the shore. There is also a similar sand, but more irregularly shaped, lying to the northward of the entrance to the Lister. This bank runs nearly N.E. by N. and S.W. by S., 7 miles, with only 4 and $4\frac{1}{2}$ fathoms upon it; its south end lies W.N.W., 9 miles from Rom Island: and between its northern end and the dangerous shoals which run off 11 miles, is a passage, 3 miles, with 6 to 5 fathoms in it.

VARDE, or WARDA.—The harbour of Warda lies to the S.E. of the Horn Point. It has, upon the bar, not less than 18 feet at high water. There are 2 buoys at the entrance, the first black, the second white; the former is to be left on the starboard, and the latter on the port or larboard side. The harbour may be known by a small white steeple on the north side, and the great steeple to the southward of it; but strangers should not venture in without a pilot.

The HORN is a sandy steep point, of moderate height, bearing from Heligoland N.E. by N. $\frac{1}{2}$ N., distant $27\frac{1}{2}$ leagues. From this point extensive *reefs* and *shoals* stretch out to the westward full 15 miles, and are formed of long ribs, or hard shallow

ridges of sand, with channels of deep water between them; their eastern edge is detached from the Horn Sandy Point about 3 miles, and has two channels, of 4, 5, and 6 fathoms, between; but these passages are encumbered with several *dangerous knolls*, and the mariner who ventures through them, must be very cautious, and keep his lead continually going.

The *Horn Reefs* are very dangerous, and numerous vessels have been wrecked upon them; but their extent has been lately examined, and it appears there is good anchorage within them, even with on-shore winds. The land to the southward of Horn Point has a flat appearance. In coming in from the southward of these sands, you should endeavour to bring the great steeple of Warda to bear E.N.E.; you will then perceive the breakers on the sands, especially should there be any swell of the sea. By these you must steer, and haul up inside of them, at about 3 or 4 miles from the land, Horn Point then bearing N.N.E. You may work within the sands, standing in to 4 and off to 8 fathoms, anchoring on either side of them, as may be most convenient; but if you get to the northward of these sands, and are unable to clear them, you will not find the shelter there so good as to the southward; you had, therefore, better anchor before you see the land. The outer point of the sands is shoaler than farther in, being a long flat, of 6 and 7 fathoms; but from Warda to Horn Point, the riding will be found good, about 3 or 4 miles from land.

Should a ship get among these sands, not understanding on which side of them her situation is, and being unable to return the way she came in, she will meet with some places of 8 and 9 fathoms, where she ought immediately to anchor; for should she, in endeavouring to extricate herself, be obliged to drive from sand to sand, it will seldom fail terminating in a wreck. The above are from the observations of an officer in the British Navy. By a late Danish survey, it appears that the outer Horn Reef Sands extend from Horn Point N.W. by W. $\frac{1}{2}$ W., full 15 miles, terminating in several *shoals*, with from 9 to 15 feet on them: from thence various *shoal banks* stretch south-eastward 15 miles. Between their eastern end and the shore are two channels, of 4, 5, and 6 fathoms water. The outer one is called the Wetser Stuge, the inner one Ringkiobing Deep. This latter passage is bounded to the eastward by the in-shore sands, and to the westward by a bank, about 4 miles long. This channel has from $3\frac{1}{2}$ to 6 fathoms water in it; and vessels may ride there, having Horn Point bearing E.S.E. $\frac{1}{2}$ E., distant 3 miles. The outer passage is broader, and formed by the above banks and the Horn Reefs. In this are from 4 to 9 fathoms; but there are two small *knolls* at the southern entrance of these channels, called the *Knob* and *Cancer*, which must be guarded against. Between these shoals are 4 fathoms; between the Cancer and the sand which stretches from Horn Point, 10 fathoms; and between the Knob and the Ujevum Bank 4 fathoms. To the southward, between Horn Point and Sylt Island, the soundings toward the shore gradually decrease from 10 fathoms, which depth will be found about 20 miles distant from Sylt Island, and bearing W. by S. from the entrance to Lister Deep, to 3 and 2 fathoms at its entrance. N.N.W. $\frac{1}{2}$ W. from Horn Point, distant 11 miles, lies the *Wejers Bank*, having 5 fathoms over it; and, in the same direction, $7\frac{1}{2}$ miles farther off, is the *Knolden*, of 7 fathoms. Round these are 8 and 9 fathoms, and between them 16 to 15 fathoms, with a few spots of 9 fathoms, then 10, 8, and 4, as you approach the land.

From Horn Point, the shore extends N.E. by N., 15 miles, to the entrance of Ringkiobing Fiord, the channel of which is pointed out by 2 beacons. A narrow isthmus, called Numet Land, which is very extensive, separates the Fiord from the sea. The land then stretches N.N.E., 45 miles, to Round Head, Bovenbergen, and thence more to the eastward, towards Holmen, commonly called the Holms. From Holmen its direction is E. by S. to Bolbiorg, and thence it forms a kind of circular bay toward Robsnout. Robsnout bears E. $\frac{1}{2}$ N., distant 43 miles from Holmen. From Robsnout to Hartshalls the coast runs N.E. by E. $\frac{1}{2}$ E., $10\frac{1}{2}$ miles, and then turns more eastward to the Scaw, the distance from Hartshalls to the Scaw being 23 miles.*

* AGGER CHANNEL, from the North Sea to the Cattegat.—Early in the year 1836, it was announced, that the sea had made an irruption on the west coast of Jutland, through a narrow tract of land, which formed a barrier between the sea and the Lim Fiord, a large inland lake, which communicates on the east coast with the Cattegat. The aperture thus formed, called the Agger Channel (from its immediate proximity to the fishing village of Agger), is situated in latitude $56^{\circ} 41'$ north, and establishes a junction with the Lim Fiord and the North Sea, by which the northern part of the peninsula is perfectly isolated.

Hantsholm lighthouse, N.W. coast of Jutland (in latitude $57^{\circ} 6' 50''$ north, and longitude $8^{\circ} 36' 10''$ east), was first lighted on the 15th December, 1843, and exhibits a reverberatory lenticular light, the lighthouse being 57 feet in height, and the light 212 feet above the level of the sea, and visible 6 leagues. This light will show a flash, of 15 seconds' duration, every $\frac{1}{2}$ minute, and, therefore, will be easily distinguished from the Scaw light, which is a fixed one, as well as the Norwegian light on Oxoe, which is varied by flashes every fourth minute.

The coast from Horn Point to the Scaw is generally low, and not to be seen above 4 or 5 leagues off; but the following places will be visible at a greater distance, viz.:—a round hill to the northward of Horn Point, a white sand-hill to the northward of Ringkiøbing, the high steeple-cliffs of Bovenbergen, the Holms or Holmen, Robsnout, and Hartshalls. Robsnout is a high bluff round hill, with a church at the top, and may be seen 6 or 7 leagues. Holmen makes like islands; and Hartshalls is a long smooth hill, low in the centre, and steep at the east end. In the bight, between Robsnout and Hartshalls, is a remarkable church, with a square steeple. The Scaw Point is very low, with a lighthouse, kept white, upon it, bearing a fixed bright light, 67 feet high, which is continued throughout the year. From off its point a *rocky reef* extends $2\frac{1}{2}$ miles, its N.E. extremity lying with the church and lighthouse in one, bearing W. by S. The north side of the reef is steep-to, and should not be approached nearer than 10 fathoms.*

Four miles off the land, about Holmen, is a *sandy ridge*, of 11, 12, and 13 fathoms, while close inside its edge are 19 and 20 fathoms, and between it and the shore 17, 16, 14, 7, and 6 fathoms, decreasing as you get nearer to the land. Nearly N.E. from Holmen, distant 5 miles, is a dangerous *rocky spot*, of 2 fathoms, called the *Stone Bank*; and within it, somewhat nearer to the shore, is another shallow *bank* or *knoll*. Both of these have deep-water round them. Great care, therefore, must be taken to give the Holmen a wide berth in passing. Off Bolbjerg western point also is a *rocky reef*, stretching to the northward, called *Brægene*. N.E. from the same point, distant $8\frac{1}{2}$ miles, and E. by N. from Holmen Point, distant 17 miles, is a *rock*, under water, called the *Vester Yder Hag*, having $7\frac{1}{2}$ fathoms on it, with deep water (9 and 11 fathoms) close

In reference to this channel, (the Agger,) the Lords Commissioners of the Admiralty received a despatch from his Majesty's Consul at Elsinore, of which the following is an extract:—

"With a view of facilitating the navigation through that (the Agger) channel, the Danish Admiralty, by an order, dated the 7th of April, have sanctioned the erection of a pilot-establishment at its entrance from the North Sea. In consequence, to the south of that entrance, on a sandy eminence, and near a temporary watch-house, has been placed a signal-post, the flag of which, hoisted at top, signifies that the vessel has been observed, and that the assistance of a pilot is offered. The said flag being lowered once, denotes one foot of water; twice, two feet; three times, three feet; four times, four feet; five times, five feet; six times, six feet; and so forth. After this the pilots go out towards the vessel to make the customary signals. The rate of pilotage payable, according to a tariff exhibited in the pilot-office, has been fixed for the present, at two rix bank dollars, silver, equal to 4s. 6d. sterling, per foot of the ship's draught of water; and in the winter season at one-third more, which rate will be eventually reduced one-third more, should the navigation of the channel increase. Ships entering from the North Sea, may obtain pilots for the several ports and places situated in the Lim Fiord.

"According to the soundings, which have been taken at different periods, the depth of the western entrance varies from 5 to 7 feet; and at the eastern entrance, from $5\frac{1}{2}$ to 6 feet. In the channel itself, which affords good anchorage, the depth, both from the frith and the sea, increases to 18 feet; which depth, however, is subject to continual changes. The mouth of the channel, towards the sea, is about $\frac{1}{2}$ a Danish mile, or 2 nautical miles wide; but farther up towards the frith, it declines from 250 to 50 fathoms. Its length from the sea, to the commencement of the frith, is supposed to be $\frac{3}{4}$ of a Danish mile, or 3 nautical miles.

"Any alteration in the course or depth of this channel, as well as the names of the vessels frequenting it, will from time to time be communicated in the Danish papers."—*Elsinore, May 14th, 1836.*

* The Board of Customs at Copenhagen has issued the following notice, dated September 29, 1832:—"As it may be of importance to all ship-masters, who, in the winter, or in the early part of the spring, are coming from the Sleeve to the Cattagat, to be informed if there be any drift ice in the Cattagat, it has been ordered, that a white flag, with a perpendicular blue stripe in the middle, is to be hoisted, during the day-time, from the lighthouse upon the Scaw Point, as often and so long as ice may be visible from the lighthouse, to such an extent, and in such a quantity, as might be supposed to obstruct the navigation of the Cattagat, &c."

[NORTH SEA.]

B B

to it. E. $\frac{1}{2}$ N., 30 $\frac{1}{2}$ miles from Holmen west point, and W. by S., 11 miles from Robsnout, lies the *Lokken Rock*, with 13 fathoms close to its inner side. W.N.W. $\frac{1}{2}$ N., 2 leagues from Robsnout, is the *Bakken*, another rock, of a similar description, having 4 $\frac{1}{2}$ fathoms over it. E. $\frac{1}{2}$ N., 3 miles from which is a rocky patch, of 3 $\frac{1}{2}$ fathoms, called the *Red Ground*; and W.N.W., 2 leagues from Hartshalls, is another spot of red ground. S.W. $\frac{1}{2}$ W. from this latter is a similar spot, distant 2 miles. There are also some rocks under water about Hartshalls, with 10 and 12 fathoms close to them. These latter are very dangerous, and many vessels have been lost upon them. There are also 2 banks nearly parallel to, and about 5 miles from, the shore, upon which are from 5 to 10 fathoms. Between them and the shore are from 12 to 4 fathoms, and outside of them very deep water.

SAILING DIRECTIONS FROM HELIGOLAND TO THE SCAW.

VESSELS bound from Heligoland to the Scaw, should take a N. $\frac{1}{2}$ E. course, full 30 leagues, by which they will be carried to the westward of all the dangerous sands about Horn Point, in from 12 to 20 fathoms water, all sandy ground. Having passed these reefs, they may proceed N.E. by N., 20 leagues, or to abreast of Bovenbergen. Then a N.E. $\frac{1}{2}$ E. course, 12 leagues farther, will bring you into the latitude of the Holmen, near which a conspicuous lighthouse has lately been erected, exhibiting a flashing light, visible 6 leagues. The depth decreases all the way towards the shores of Jutland, but without any danger. The current, however, frequently sets strongly to the north-eastward in this part, which should be particularly guarded against in hazy weather; for between Bovenbergen and the Holmen, it will be difficult to ascertain by the lead your distance from the land, it being an extensive flat. As soon as you arrive in the latitude of the Holmen, you will have deep water—near 30 fathoms at 5 leagues from the land. Here the deep-sea lead should be particularly attended to: in dark weather it is your safest guide. Vessels have often been lost near this part of the coast, during north-westerly winds, by keeping away too soon. The new light on Hartsholm will be of the greatest service to mariners navigating this part of the coast. But when Holmen comes S.E. by S., steer E. by N. for 18 leagues, and keep at least 10 miles from land, for within this tract are several rocks, under water, with deep-water all round them. The situation of these have already been accurately described. Give them a good berth; and when Hartshalls Church bears S.S.E. from you, an E.S.E. course will take you clear to the Scaw.

When the Holmen bears S. $\frac{1}{2}$ E., distant 10 or 12 miles, it has the appearance of several detached islands, with a church to the south-westward, the surrounding land being too low to be seen. That extensive bank, called the *Jutland Reef*, runs along shore all the way to the Scaw. The depths over this part of it are various and irregular. Abreast of the Naze of Norway, its boundary appears to be in latitude about 57° 28'. Opposite to the Holmen it advances toward the north-eastward; and abreast of the Scaw it reaches nearly to 58°. This will best be understood by a reference to the chart.

As you advance, you will readily discover the Scaw light; and, if bound into the Cattegat, can easily give that a sufficient berth in rounding it, to avoid the reefs which run off it. The lighthouse is 67 feet high, and lighted with lamps. The church is also a conspicuous object, and, when the weather is clear, will be visible 3 or 4 leagues. If desirous of anchoring on the south side of the Scaw, you may bring-up, with the lighthouse bearing N. by W., in 8 or 9 fathoms; and here, with westerly winds, you will ride in safety. Pilots are always to be obtained from the Scaw to take you up the Cattegat.

It is high water, full and change, at the mouth of the Eyder, at 12 o'clock; at Horn Point, at 12; and at Ringkioberg Fiord, at 20 minutes after 11.

TIDES.—The tide rises at Heligoland about 9 feet. At Bovenbergen there is very little rise or fall, the water generally being governed by the prevailing wind. Between the Horn Point and the Elbe and Weser, there is commonly an indraught to the south-eastward. To the northward of Horn Reef, about Holmen, the current, with westerly

winds, will run at the rate of 2 miles an hour; and with strong S.S.W. gales, it increases its rapidity to 3 miles: a circumstance which should be particularly attended to, especially in dark weather.

THE COAST OF NORWAY, FROM THE NAZE TO CHRISTIANIA.

Description of the Land, &c.

THE whole coast of Norway is very irregular and mountainous. The points of land, which extend considerably into the sea, form innumerable bays; many of which are wide and deep; and the numerous islands and rocks which lie along the coast, make many of those bays excellent harbours. Although those very islands and rocks which make the harbour safe and commodious to lie in, render them difficult of access, that difficulty is, in a great measure, obviated by the certainty of getting good pilots, who frequently come off when the sea is so high, that they are obliged to sling themselves in a rope, and be taken into the ship over the quarter.

Vessels making any part of this coast, should make their signal for a pilot in time, by firing a gun, and making the usual signal (a flag at the fore) for a pilot.

LINDERSNAES, or the NAZE, is a reddish bluff headland, and well known, being the most southerly cape of Norway. It has, for many years, been distinguished by two coal lights at night. There is now a light tower upon it, which is always kept white, so as to be serviceable both by day and night. Over it, a little inland, is the high land of Spangereid, generally covered with snow in the spring, and which, in clear weather, may be seen at the distance of 12 leagues from the coast.

About S.E. by E., distant 8 miles from Mark-Oe, and $5\frac{1}{2}$ miles from the Naze, is a very dangerous rock, called the *Gieslingene*, or *Swine Rock*, upon which, many vessels have been wrecked. There is a good passage between it and Udvar Islands, which lie to the north-eastward.

MANDAL.—Four leagues E.S.E. from the Naze, lies the entrance of Manne Fiord, the haven of the trading town called Mandal, where pilots may readily be obtained.

HELLIS-OE.—At the distance of 4 leagues to the eastward of the entrance of Mandal, and 4 miles westward of the island called Flekker-Oe, lies the island called Hellis-Oe. This place is distinguished by two towers, or beacons, painted white, with a high bar upon each, so that they may, in light weather, be seen at the distance of 3 or 4 leagues.

FLEKKER-OE-HAVEN.—The west gat of the haven of Flekker-Oe lies $8\frac{1}{2}$ miles to the eastward of Hellis-Oe. This harbour is well known.

CHRISTIANSAND.—Christiansand is one of the chief cities of Norway; said to contain 135,000 inhabitants, and carries on a very considerable commerce, principally in the exportation of timber, and the fisheries. The town is built upon a sandy plain, close to the sea; and has one of the best harbours in Norway, for vessels lie almost close to the doors of the warehouses. Ship-building is carried on here to a great extent. The island of Flekker-Oe forms, with the main land, a roadstead several miles long; and there is good anchorage, in 8 or 9 fathoms. It is much frequented by shipping, which may here be repaired; and mariners may obtain, in case of accident, all assistance that may be required. Numerous harbours lie along the coast to the eastward of Christiansand, with the towns of Lillesand, Grimstad, Arendal, Twedelstrand, Oester, Riisoer, Krageroe, Skeen, and Laurvig, &c.; to the eastward of which is Christiania Fiord. Here, at the western side of its entrance, is the small island of Faerder, on which stands a lighthouse; and farther on, is the Fugelhuk Rock, where a revolving light has lately been erected, to guide vessels to Dram and Christiania.

The south and east coasts of Norway were, heretofore, only to be distinguished by the lighthouses of Mark-Oe and Lindersnaes, with the two towers, or beacons, of Hellis-Oe; but now an additional number of beacons, or marks, have been erected, by which;

the mariner will be enabled to ascertain the situation of his vessel with great facility. These are constructed of different shapes, and exhibited upon the charts of the North Sea and Sleeve, published by the proprietor of this work, being situated as follows:—

The first is on Feroe, at the entrance to Fahr sound, and bears N.W. $\frac{1}{2}$ N. from Mark-Oe, distant $6\frac{1}{4}$ miles. It is 28 feet high, has a sloping kind of roof, and the whole is painted red. The second is built upon the Ryvingen Rock, nearly 15 miles to the eastward of Lindersnaes lighthouse. It is $30\frac{1}{2}$ feet high, and pointed at the top. The third stands upon the island of Ulvoe, on the eastern side of the entrance to Christiansand, and 26 miles to the eastward of the Ryvingen Rock. This is 31 feet high, and has a cross at its summit. The fourth is erected upon the Nodingen Rock, a little to the southward of Justoe. This is $26\frac{1}{4}$ feet in height, being a round building, with a long cross over its roof. The fifth is situated at Hamborgoe, eastward of Lillesand. This sea-mark has the appearance of a windmill, the vanes of which describe an angle of 45 degrees, towards the horizon. It is painted yellowish, and situated in latitude $58^{\circ} 14' 4''$ north, and longitude $8^{\circ} 36' 15''$ east; and visible at the distance of 10 or 12 miles. The sixth is situated near the entrance to Grimstad, and built upon Hesnæsøe, nearly in latitude $58^{\circ} 20'$ north, and about 13 miles to the north-eastward of the Nodingen beacon. It is of a triangular form, with a long pole projecting upwards, its height being 31 feet. The seventh is erected on the Bouden Rock, at the eastern entrance into Tromsø Sound, having the appearance of a shortened cone. It is painted yellow; is 14 feet high, by 8 feet in diameter; and is 30 feet above the level of the sea, in latitude $58^{\circ} 30' 40''$ north, and longitude $9^{\circ} 4' 40''$ east. It may be clearly seen 7 or 8 miles. The eighth is erected upon the island of Sandoe, and presents a column, tapering upon the base upwards, its height being 33 feet. This is in latitude $58^{\circ} 35'$ north. The ninth stands on Svenoie, and is erected on four piles, being surmounted by a cross; in all 30 feet high. This is in latitude $58^{\circ} 57'$ north, longitude $10^{\circ} 14'$ east from Greenwich. The appearance of the beacons cannot fail of being eminently serviceable to the navigation of this part of the coast of Norway.

The three lighthouses at Arendal are painted white.

There has also lately been erected a lighthouse on Jomfruland, in latitude $58^{\circ} 51'$ north, and longitude $9^{\circ} 41'$ ~~west~~. This lighthouse is 130 feet high, with a revolving light, which shows a bright flash every $\frac{1}{2}$ minute.

SAILING DIRECTIONS FROM THE NAZE TO CHRISTIANIA.

WHEN you are steering towards the Naze from the southward, you must, after crossing the *Dogger Bank*, be cautious, and sound in time for the *Jutland Reef*, especially with southerly and S.W. winds, for then the current sets strongly to the northward. Between the north end of the bank and the reef, you will have from 30 to 38 fathoms water. The depth on the reef will be less; but after crossing it, you will immediately have deeper water again.

Having crossed the Jutland Reef, and approached within a few leagues of the land, if by night, and clear weather, you will discover the Naze light. Should you happen to be running in between the Naze and Mark-Oe, do not bring the light on the Naze more southerly than S.E. by E., in order to avoid the *Bispen Rock*, and some *ridges* within it. But should you come in to the eastward of the Naze, approach no nearer to the land, than to bring the Naze light N.W., in order to keep clear of the *rocky islet*, called *Gieslingen*, which bears S.E. by E., about $5\frac{1}{4}$ miles from the Naze.

Coming from the westward, with a strong gale of westerly wind, by day, and being desirous to put into one of the havens on the east side of the Naze, the best way will be, to pass the point; and when round it, steer to the N.E. for the passage, when pilots will most likely come out; but should that be impossible, haul off, and pass to the westward of the Gieslingen, which is always visible above water, and on which the sea constantly breaks.

MANDAL.—In proceeding for this place, you will endeavour to obtain a sight of the Naze, and proceed in such a manner, as to avoid the Gieslingen. The entrance of Mandal is known by two hills upon the coast, on the east side, called the Cow and Calf.

When you have advanced so far to the eastward as to open these hills clear of Hille-Oe, which is high and pointed; or still farther, until you are directly off Manne Fiord, when the two hills appear in a line, or become hidden by the eastern land, you will be able to determine where you are, and may haul somewhat nearer in to the east of Hille-Oe, where you will have a good mark in the yellow sand, which is on the west side of Mandal, and which may be seen very plainly at some distance from the sea; and on the east side is the Ryvingen beacon, 30½ feet high, and painted at the top. Here a pilot may be obtained for Christiania.

HELLIS-OE is a small island, and, as before observed, distinguished by two towers, which serve as a mark for this part of the coast, there being no other remarkable objects hereabout, the land stretching evenly along. These towers are painted white, with a high bar upon each, so that, in clear weather, they may be seen at the distance of 3 or 4 leagues; and, though they stand near each other, yet they will never appear as one, unless you be quite in amongst the rocks, which, hereabout, lie a full league from the shore; so that they afford a mark particularly useful, that cannot be mistaken. By a bearing of this mark, the mariner will be enabled to ascertain his situation, and determine where best to stand in for the land. Within Hellis-Oe is one of the best havens on the coast for ships, of all sizes, to stop in.

FLEKKER-OE HAVEN.—The entrance is divided by the island Flekker-Oe into the East and West Gats, the latter of which lies 3½ miles to the eastward of Hellis-Oe. Upon a small island in the bay, is the fortress or castle, which is very remarkable when before the entry, and not hidden by Flekker-Oe. This harbour is capable of containing a number of ships, which are made fast by rings on the shore. The depth is from 14 to 18 fathoms; but far off, the bottom is, in several places, *rocky*; and, in some parts, apparently clean, the cables will frequently be found damaged. Ships of war, and other heavy ships, should lie to the southward of the castle, where there is some sea, when the wind blows directly in through the opening. As there are two entrances, ships may sail from this place with winds from W.S.W., round to north, and E.S.E. With westerly winds you may also go readily from hence, within the ridges, for Christiansand. At the south-west end of Flekker-Oe is Grundviigkil Creek, wherein ships, not drawing more than 10 or 12 feet water, may stand into 3 and 4 fathoms, sandy ground.

CHRISTIANSAND.—There are several good marks for standing in towards the entrance of Christiansand, particularly the two hills, called the Turned-up Boat and the Baksteen. In coming along from the west, or south-west, towards the land, the white towers of Hellis-Oe will be a good direction; and when you are off Flekker-Oe, and at some distance to the eastward, towards or beyond Randoerne, the opening will be seen that is formed by Torrisdal's River, which passes on the east side of Christiansand, appearing like a valley amongst high hills, of which those on the east side are steep. The small hillock seen upon the mountain, is that called the Turned-up Boat, or Omvente Baad.

Four miles to the west of the city, will be seen the Baksteen, resembling the crown of a hat, being steep on the south-west side. When coming near the mouth of the entrance, you will see the city with the bay, but you must then be somewhat towards the east side, or it will be hidden by Odder-Oe, which is high.

The marks before mentioned, will obviate all difficulty in sailing up to Christiansand, or to the East Gat, or passage of Flekker-Oe; and if the weather be not uncommonly tempestuous, you will readily obtain a pilot.

The more southerly ridge outside of Randoerne, may be approached within some cables' length, and all else the sea breaks upon. Randoerne is, in comparison with the other land, low and even.

A lighthouse has been erected upon Ox-Oe islet, to the east of Flekker-Oe, at the eastern entrance to Christiansand, which exhibits a light 135 feet above the surface of the sea. Within a distance of 16 miles the light is seen, in clear weather, with a steady flame, for 2 minutes and 55 seconds; it then changes into a faint light, succeeded by a strong flash, and again a faint light; after which it shows itself again for 2 minutes and 55 seconds, with a steady bright light. The bright flashes appear every 4 minutes, and may be distinguished 20 miles off; but the steady light gradually disappears when beyond 14 to 16 miles. The light is visible from all points of the compass, and is kept up throughout the year. The lighthouse is white, and serves as a sea-mark by day.

In connection with the light on Ox-Oe, a harbour-light is placed on Oder-Oe Island, at 4 miles N. $\frac{1}{2}$ W. from Ox-Oe. The light on Oder-Oe Island will be seen, in clear weather, from the lower rigging, bearing N. by W. $\frac{3}{4}$ W.; and by steering this course, and continually keeping Oder-Oe light in sight, all rocks and shoals will be avoided, until within 20 fathoms of the light, when the course must be altered to N.W. by N. $\frac{1}{2}$ W. Continuing the last-mentioned course, steering in betwixt Oder-Oe Island and Dybingholmen House, the lower lights on Oder-Oe lighthouse will be visible one after the other: then having passed 5 cables' length from this light, you may anchor, in 30 or 40 fathoms. The light on Oder-Oe is elevated 25 feet above the surface of the sea, and is lighted and extinguished at the same time as Ox-Oe light, with the exception of the last-mentioned two low lights, which are not lighted between the 31st May and 1st August.

It is to be observed, that the channel betwixt the shoals, near Ox-Oe and Groningen, where Oder-Oe light is visible, is 3 or 4 cables' length broad. In the middle of the said passage, on a N.N.W. $\frac{3}{4}$ N. course, the light will appear most luminous. On each side of this line of bearing, the luminous parts will decrease, and at last disappear; you will then be $1\frac{1}{2}$ to 2 cables' length from the nearest shoals.

At Christiansand are two harbours; but the western one is the most frequented, the passage being between Dybingsholm and Oder-Oe. You may leave it with all winds to the northward, between W. by S. and E. by S.; and in calm weather, when the wind is somewhat unsteady, you may warp out by means of the rings fixed for that purpose.

In the eastern haven, which is at the south side of the city, or east of Oder-Oe, ships may lie very well, especially those bound to the west, as they can conveniently come from it with a southerly wind, to the east and south-east.

On the east side of Oder-Oe, there is a safe and good harbour, called Hullet, which is now fitted up for a quarantine haven, wherein all ships from infected places are compelled to come in, before they touch at other harbours.

In the mouth of Topdals Fiord, there is a very good and spacious stopping-place, called Wigehaven, which is much frequented by ships opposed by adverse winds, particularly those bound to the west. You can enter with winds from the N.W. to E.S.E. The depths are various, from 20 to 4 fathoms.

It is observable, that although Norway lies so far to the north, and under a climate where the winter is severe and long, the havens, from Christiansand, westward, very seldom freeze up; and the out-havens never: but ships, at such a time, coming under the coast, may always find places of safety. Neither is drift ice much known; for it can only happen in hard winters, that the ice out of the Cattegat, and from the more eastern coast of Norway, can drive against the land about Christiansand, and somewhat more to the west, and then it happens only in the latter end of the winter, in the months of February and March; but, westward of the Naze, an instance of the ice having been a hindrance to coming into any of the harbours that lie nearest to the sea, has scarcely ever been known.

On the coast of Norway, before described, there is, apparently, no rise of the tide; but allowance must be made for the current, which commonly sets to the west and N.W. This fluctuates according to the season, and other local circumstances.

HOMBORG-SUND.—At the distance of 6 leagues north-eastward from Flekker-Oe, lies Homborg-Oe, or island, between which and the main is a passage, called Homborg-Sund, containing several good anchoring places, both on the island and main side. This place may be approached with safety, and will be found by the bearings of Grimstad, Sadlen, and Homborgsundsfiold. There is now a conspicuous sea-mark erected on Homborg-Oe, painted yellowish, having the appearance of a windmill, the vanes of which describe an angle of 45 degrees towards the horizon, and visible 10 or 12 miles. The passage in, is to the north-east of the island; and in order to avoid a *ridge of rocks*, which extends $\frac{1}{2}$ a mile N.E. from the end of the island, keep well over towards the main, before you haul to the south-westward.

BIOR-OE lies about 2 miles north-eastward from Homborg-Oe. Small ships bound to the eastward, in the summer season, may stop within this island. The entrance is on its south-west side, and the harbour has from 2 to 4 fathoms water, on sand and grass

bottom, with a ring for mooring by. With westerly winds, so far to the southward as S.S.W., you may sail out to seaward.

GROS FIORD, or GRIMSTAD HARBOUR, lies about 3 miles farther north-eastward. Here are several stopping-places, and various entrances. Large ships can go in but one way, namely, from the southward, and then only in moderate weather, with fair wind; because there are several *ledges of rocks and shoals* about. The other passages are intricate and dangerous. The harbour, however, is good, and has 11 or 12 fathoms water, clay bottom; but it can be left with northerly winds only. On the eastern side of the entrance, stands Hesnaesoa beacon, 31 feet high, of a triangular form, with a long pole projecting upwards.

ARENDAL HARBOUR is capacious, and capable of containing the largest ships. The entrance is 14 miles to the north-east of Homborg-Oe, and lies with the high land, called Grimstad Sadlen, bearing about W. $\frac{1}{2}$ N., and Homborgsundsfall N.W. by N. The church on Trom-Oe is another mark by which it may be known. This appears white, with a black roof, and is very conspicuous under the high double land. Arendal is one of the most considerable trading towns in Norway, and has three wharfs, where ships can be repaired. Large ships anchor in from 18 to 24 fathoms water, and moor, fore and aft, by means of rings. Small ships lie in the pool, and at the different landing-places, according to circumstances. Mærd-Oe is an island lying directly off the southern entrance of the harbour of Arendal, and has within it several anchorages. Off the north side of it is an islet, called Skudholm, between which and Mærd-Oe, is the anchorage, called Mærd-Oe Harbour, where there are 12 fathoms water, upon a sandy bottom, shoaling towards the island, and deepening to the northward. For this reason ships do not ride quite so well here with southerly as with other winds, although the island affords them shelter, and is well provided with mooring rings. With north-west gales, there are frequently sudden gusts of wind from the main land. Notwithstanding these disadvantages, this place is much resorted to, as a stopping harbour. As there is a channel on each side of the entrance of Arendal Harbour, vessels may get away from it with all those winds with which they can clear the coast. It, however, sometimes happens, that the wind is quite different within the entrance, between the high land, than outside, or at sea. Heavy ships can get out by the western passage only, and with the winds between N.N.W. and E.S.E. Between Mærd-Oe and the island to the northward, called Jes-Oe, there is only sufficient depth for ships of 11 or 12 feet draught; and between Jes-Oe and the southernmost point of Trom-Oe, there are only 7 or 8 feet water.

ARENDAL LIGHTS.—A fixed light on Great Tonningen Island, in latitude $58^{\circ} 23' 15''$ north, and longitude $8^{\circ} 52' 30''$ east; and a fixed light on Little Tonningen Island, bearing from the light on Great Tonningen Island, N.N.E., 1,237 yards. Both the above lights are visible in all directions; and, being 130 feet above the level of the sea, may be seen at the distance of 6 or 7 leagues.

A fixed light is placed on Sandvig Point, at the entrance to Arendal, 42 feet above the level of the sea, visible from 3 to 4 leagues, on any bearing westward of south, and E.N.E. by compass, unless concealed by adjacent land. The buildings of the above three lights are white.

Directions for Arendal.—1. When about 2 miles from the land, a vessel should bring Sandvig Point light N. $\frac{1}{4}$ E., or a sail's breadth open east of Little Tonningen light, and keep along the land eastward of Little Tonningen, for Sandvig Point light. The distance from Little Tonningen to Sandvig Point is a mile; when about 3 cables' length will lead to a good berth, in from 12 to 16 fathoms.

2. A vessel passing Great and Little Tonningen Islands, should keep $\frac{1}{4}$ of a cable's length from Great Tonningen. When Sandvig light bears N. by E. $\frac{1}{4}$ E., steer for it, and when within $\frac{1}{4}$ of a cable from it, may bring-up. The first of the above channels is the easier for strangers.*

* These directions do not agree with the Danish Chart, published in 1843, with Sandvig Point light bearing N. $\frac{1}{4}$ E. It is open to the westward of Little Tonningen.—*Ed. Nautical Magazine*, Vol. XIII, p. 638.

In order to prevent any of the above lights from being mistaken for those of Markoe or Lindernaes, on the south part of Norway, the light of Markoe was discontinued on the 1st July, 1844.

TROM-OE SOUND.—A new beacon has been erected on Bouden Rock, entrance of Trom-Oe Sound, in latitude $58^{\circ} 30' 40''$ north, and longitude $9^{\circ} 4' 40''$ east.

OSTER RIISOER is a populous place of active trade, and has a capacious and very good harbour, with various depths of water, from 4 to 24 fathoms, to which there are several passages, between the outer ledges and islets. It lies about $7\frac{1}{2}$ leagues to the north-eastward of Mørd-Oe, and may be known by a white-washed spot upon a hill close to Oster Riisoer, which is thus preserved as a mark. From Oster Riisoer vessels may proceed to sea on both sides, and with all winds, by which the land may be cleared. There are several places in the passage up wherein shipping may stop, but the channels are too intricate for a stranger to attempt without a pilot. Here is also a carenage, and all the materials kept for heaving down large ships.

From Oster Riisoer to Færder Island, the bearing and distance are E. $\frac{1}{2}$ N., 15 leagues. Between are several good harbours, namely:—Krager-Oe, Lang Oesund, Porsgrund, Laurvig, and Sande Fiord. Krager-Oe and Porsgrund are loading ports. At Jumfruland, near the entrance to Krager-Oe, a revolving light is established, 130 feet high, which shows a bright flash every $\frac{1}{2}$ minute, visible 6 leagues, but not totally eclipsed within the distance of 8 miles. At Lang Oesund, there is a fixed harbour light, 40 feet high. Færder Island is remarkably high and conical, and lies near the range of islands on the coast, at the entrance of the Great Sound of Christiania. It has a lighthouse on it, in which the light is surrounded with windows, 224 feet above the level of the sea. When you get to Færder Island, you must take a pilot, if you have not previously got one, who will conduct you to Frederickshall, Christiania, Dram, or any other adjacent port. There is now a lighthouse erected upon the Fuglehuk Rocks, which exhibits a revolving light, eclipsed every $\frac{1}{2}$ minute, to distinguish it from Færder Island light. These Fuglehuk Rocks lie about N.E. $\frac{3}{4}$ N. from Færder Island, distant 7 miles. Near Fuglehuk light a bell is suspended, with which, in foggy weather, when the light cannot be seen, at the distance of $\frac{1}{2}$ to $\frac{1}{3}$ a league, ten or twelve strokes will be given, at night, every $\frac{1}{4}$, and during the day, every $\frac{1}{2}$ hour. In case the wind and sea should be so high, that a vessel cannot beat up for the coast, which will be very difficult, as the current sets on the shore with heavy gales; and having no pilot on board, she may with safety run in for Færder light; and from thence steer for the Fuglehuk light, where, in tolerably smooth water, she can keep cruising in sight of the light until morning. She can always keep her position, as the current from Dram and Christiania will be under her lee side; or should a pilot be on board, he will from thence readily run her, at any time, to a good anchorage.

TONSBERG.—There are several towns and harbours situated in the Fiord of Christiania, where vessels occasionally resort. Of these, the first, or nearest to the Fuglehuk light, is Tonsberg. This is an old town; and said to be the most ancient in the kingdom of Norway. Its harbour is capable of receiving large vessels; and its trade is chiefly in timber. The town has gone to decay, and now has not above 200 houses; yet it carries on a considerable retail traffic with several parts of the interior country.

A N. by E. course from the Fuglehuk Rocks will carry you up the Christiania Fiord, nearly in mid-channel; and about 22 miles distant, on the port or larboard side, is the town of Holmerstrand, neatly built, with about 1000 inhabitants; a little beyond which, is the entrance to the Dram Fiord. This is a branch, or arm of the sea, running up to Bragernaes and Stromso, two towns which carry on a considerable traffic in timber and iron; but the harbour admits only small vessels.

There is a fixed light on Basto Island, 28 feet high, to be left on your port or larboard hand going up; and on Rodtangen, at the starboard entrance to Dram Fiord, is a fixed light, 35 feet high, and kept lighted from the 15th of July to the 31st of May, every night, from sun-set to sun-rise.

CHRISTIANIA.—To the eastward of Dram Fiord, is the channel to Christiania, the capital of Norway. It is situated at the farther end of the Fiord or Gulf, in the province of Aggerhuus. In the Christiania Fiord, above Basto Island, are three other lights, all fixed, and kept burning from sun-set to sun-rise, from the 15th of July to the 31st of May. The first of these lights is at Filvet, 12 miles northward of Basto; the light is 24 feet high, and must be left on your port or larboard hand going up. The second is at Steilness, 14 miles northward of Filvet; this light is 22 feet high, and

must be left on your starboard hand going up. The third is the harbour-light at Haegholmen, 23 feet high. This gulf is inclosed on both sides by lofty mountains, interspersed with numerous rocky islands. The city is well built, and has about 10,000 inhabitants. That part of the town, called the Quartal, which lies close to the harbour, is principally occupied by merchants and public offices. A considerable trade is carried on; and a great annual fair is held on January 13th. The manufactories are but few, chiefly of coarse cloth and cordage; but the exports are fish, tar, soap, vitriol, alum, iron, copper, and timber. The harbour is considered to be good, and well sheltered.

There is no perceptible rise of tide about this part of the coast, from the Naze to Fæder Island; and the current, which constantly sets along shore to the westward, does not reach so far out from Færder to Jomfruland, as it does from Jomfruland to the Naze; yet, 2 or 3 leagues from the coast, it is extraordinary ever to find it setting eastward; and if occasionally it should be perceived to do so, it never continues above a day.

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FROM the Naze to Listerland, the course is N.W., several good harbours running in between. The principal of these runs to Fahrsumd. A beacon-tower, painted red, with a staff and ball on the top, is erected on Feroe Islet, at the entrance to Fahrsumd. Listerland, or Gunnarshoug Point, is a low sandy projection, lying far from the high land within it, off which are some *round stones*, called *Lister Steene*, and a *sunken rock* outside, called *Listerflue*, always covered, which are very dangerous, as the high land all along the shore puts the former quite out of sight, until you are close upon it; and indeed a ship may run on it in the night before she could perceive it. To warn mariners of these dangers, and direct them to Lister Fiord, a lighthouse has lately been erected at Gunnarshoug Point, with a revolving light, which exhibits, every minute, a bright flash for 12 seconds, after which it is darkened, but not totally eclipsed, within the distance of 8 miles. The light will be visible, in clear weather, at the distance of 16 to 20 miles.

This light is elevated 125 feet above the level of the sea, and serves as a good landmark. The tower is painted white, with a darker ring round the middle.

To prevent mistaking this for Ox-Oe light, you must remember that Ox-Oe is a steady light, which, every fourth minute, varies with a brilliant flash, after and before which, it is nearly eclipsed.

Having rounded this point, a large opening presents itself, called Lister Fiord, with several islands at its entrance, leading to Fædde Fiord and Flekke Fiord.

N.E. by E., nearly 5 miles from Gunnarshoug Point, is Warnæs Point, upon which is a lighthouse, bearing a fixed light, which may commonly be seen at the distance of 6 miles. When you have brought it to bear E.N.E. $\frac{1}{4}$ E., its strongest light will be seen at a distance of from 10 to 12 miles.

In case of necessity, when you cannot keep the vessel in the bay, between Hitter-Oe and Lister, you may run in for an anchorage in Fædde Fiord; for which purpose, you must keep nearer to the Warnæs side, and steer E. $\frac{1}{2}$ N. When you have passed the Warnæs light, and brought it to bear W.S.W., distant a mile, you will be in its strongest light on that side, and may then alter your course to E.N.E. $\frac{1}{4}$ E., at the same time keeping a good look-out for the *Elleholms* to the southward, and the *small rocks*, called *Mösseshjør* on the north side of the Fiord. By continuing the last-mentioned course, you will proceed up the middle of the Fædde Fiord, in which the lofty dark mountains on both sides will guide you, if the night be not too dark, even after you have passed Fædde and Rörvig, where you will have lost sight of the light, in consequence of intervening land. When so far, you will alter your course to E. by N., and then it is time to try for soundings. The whole distance, from Fædde to the bottom of the Fiord of Oiseaud, is a mile. When you get between 20 and 30 fathoms of water, you must directly let go your anchor, as the ground is very steep.

On the north side of Fædde Fiord there are also three other places, with the War-
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næs light partly in sight, where you may anchor, if daylight and circumstances will permit. These are the bights of Lillehavn, Hougelandsvigen, and Føedde, the depths in which are between 20 and 30 fathoms, steep and muddy bottom.

If acquainted with the coast, and wish in the night-time to run into the sound, between Hitter-Oe and Annabel-Oe, to Abelnæs, or Engelsholm, you must sail mid-channel into the Lister Fiord, between Klubben and Warnæs, until you bring the Warnæs light to bear S.W. by W.; then a N.N.E. $\frac{1}{4}$ E. course will carry you through the sound.

The mainland from Lister Fiord runs N.W. by N. to Lunderviig. Here is the harbour of Eggersund, to which there are two entrances; the southern one running in between the east side of Egger-Oe and the main, the northern channel passing to the northward of Egger-Oe. Between Listerland and Egger-Oe is a *bank*, of from 16 to 50 fathoms, running along, in the direction of the land, 11 or 12 miles, and being at the distance of more than a league from the shore. Seven miles beyond Egger-Oe is the harbour of Sirevaag, which is said to be very good. In proceeding for this harbour, you should steer towards the sandy bay on the starboard side of the entrance, till being close to the shore, you have the port open; then sailing in for the north or port or larboard shore, you run along by it to the southward, to avoid a *rock*, with only 12 feet water upon it, lying off the point on the west side. When you have got to the southward of the west point, you may anchor, in 7 or 8 fathoms, and lie land-locked with all winds, mooring with a cable or hawser to the west shore.

N. by W., 18 miles from Sirevaag, is the Point of Jedderen; off this is a dangerous reef, to which a wide berth ought always to be allowed. The land then bends N.E. by N. to several extensive bays, formed by various islands, which are situated between Jedderen and Carm-Oe. On one of these, named Huiddings-Oe, situated about midway, a lighthouse is erected, showing a fixed light, principally intended to guide the mariner into Carm Sound; and on Tungenæs, about 6 miles south-eastward of Huiddings-Oe, is a fixed harbour light, 24 feet high.

Carm Sound is situated between Carm-Oe and the neighbouring islands near the main; through which there is a passage along shore, running into Bommel Fiord, and thence between the islands all the way to Bergen. Carm-Oe lies in a N.N.E. and S.S.W. direction, being 16 miles in length, and about $4\frac{1}{2}$ miles broad at the southern end, but narrowing as it advances to the northward. At its S.E. point, called Skudesness, is a lighthouse, with a fixed light, which points out the western entrance to Carm Sound.

Mariners who wish to enter Carm Sound, may, with due attention, distinguish the light of Skudesness from that of the Isle of Huiddings. The latter, which is suspended between two poles, gives a blaze light; but the lantern light on Skudesness shows a clear and steady light; and besides, this latter light cannot be seen by those coming from the westward, unless so much to the southward, that the cliff of Gietongen does not interrupt the view of it, or that you have it bearing N.E. by E.; and on this point of the compass the navigation is clear from the Isles of Huidding; those, therefore, who have gained sight of one light, and are in doubt which it is, should steer a little easterly: the doubt will then be removed; for, if it be Skudesness light that appears, the blaze of Huidding Isles will shortly be seen, unless in hazy weather, or a snow-storm. If, by steering eastward, another light soon appears, it must be that on the Huidding Isles, and a course may thence be set, in order to take a view of the other; and if the light on Skudesness be hidden by the high land, and a light should appear more to the eastward than due N.E. by E., then be assured it is the Huidding Isles light. Having ascertained this, a vessel may steer for Skudesness with safety; and seamen may know to a certainty, by the light, where the bight is, and accordingly run under the land, and so into Carm Sound. At Hoivarde, in Carm Sound, is a fixed harbour-light, 63 feet high.

Udsire Lights.—Two lighthouses, exhibiting fixed lights, are placed on the Island of Udsire, in latitude $59^{\circ} 18'$ north, and longitude $4^{\circ} 53'$ east. The elevation of the lights above the level of the sea, is 248 English feet; and visible 18 to 20 miles. In order that they may serve as beacons during the day, the towers or lighthouses are painted of a light-red colour.

These two lights can be seen from every side, and are situated 680 English feet from each other, south 68° east, and north 68° west, by corrected compass, and were first lighted on the 15th of August, 1844, and will burn the year round, viz.:—from Michaelmas to Easter half an hour after sun-set, and from Easter to Michaelmas an hour after sun-set, and continue till sun-rise.

To persons unacquainted, who may be compelled to run into Carm Sound without a pilot, the lights of Udsire, Huidding, and Skudesness will be very useful, and particularly to those who are obliged to cruise there during the night. In that case, it is absolutely necessary to be particularly attentive that the current does not drive the vessel on either side, for it sometimes is very strong.

The extensive opening between Jedderen Reef and Carm-Oe, leads to a great number of deep fiords and harbours, where there are many good anchorages, well sheltered from both wind and sea; on one of which, to the southward, stands the town of Stavanger, the inhabitants of which are principally concerned in the fisheries.

The coast of Norway is fronted, all the way to the northward of Carm-Oe, with innumerable islands, between each of which there are deep-water channels, and passages for the largest vessels; but these are so multitudinous, so various, and so intricate, that no description can possibly be satisfactory, or enable the mariner to navigate them in safety, without the assistance of a pilot. As therefore any attempt to trace them with minute accuracy would be vain and useless, we shall endeavour to point out those channels most commonly frequented, and which eventually lead to the town of Bergen.

BERGEN, the capital of this part of Norway, is in latitude $60^{\circ} 24'$ north, and longitude $5^{\circ} 20'$ east from Greenwich. It is large, and situated at the bottom of a long bay, enclosed on all sides by rugged and barren rocky islands. This renders its harbour sheltered and secure; but its access, through numerous passages, is attended with much difficulty, and no little danger; so that no stranger ought to attempt it without the assistance of a pilot.

In sailing for the harbour of Bergen, vessels proceeding through the Carm Sound, will pass between the Skudesness and the Huddings lighthouses; and steering to the northward, between Carm-Oe and Luden, they will observe the Hoyvarden lighthouse, which is built upon a point of land, at the port or larboard side, on the Island of Carm. This channel is narrow, and brings you out through Houge Sound, to the northward of Carm-Oe, where, proceeding along shore at a convenient distance, and in deep water, you enter what is called the Leedt, or Channel of Bergen; the surrounding land is all high. About 10 miles to the northward of the northern end of Carm-Oe, is the southern extremity of Bommel-Oe, commonly called Bommelhuk. The channel between this and the main is 2 miles wide, and distinguished by the name of the Bommel Fiord; the passage in is about N.E., so far as Moster-Oe: you then turn more easterly, until you get abreast of Mosterhaven, when, taking a course due north, you enter Stock Sound; from thence, by various channels between the islands, you pass into Selb-Oe Fiord. If you are passing on the outside, or to the westward of Bommel-Oe, it will always be advisable to keep 4 or 5 miles off the land at least, on account of the numerous *rocks* and *shoals* which are scattered all about this coast. Near the middle of Bommel-Oe is the Siggen, a remarkable hill, which, in coming from the westward for Bergen, is frequently the first land you will perceive; therefore, when making the land, it will be advisable to bring this hill about S.E. or S.E. by S., keeping rather to the southward, on account of the northerly tide, until you obtain a good breeze to carry you to the northward, where you may stand in for the land, about Selb-Oe, or Kors Fiord.

Selb-Oe Fiord is 26 miles to the northward of Bommel Fiord, being at its entrance 4½ miles wide, and running in E. by S. On your starboard side as you enter, is the Akleboen Shoal, with 4 fathoms or less water over it; it lies in the fairway, and may be passed on either side.

Kors Fiord is 11 miles to the northward of Selb-Oe Fiord, and has from 200 to 300 fathoms water within it; the passage in is between the Kalv-Oe and Marsteen, or between the Marsteen and the Texlen-Oe. W.N.W. ¼ W., nearly a mile from Marsteen, is a *rock* under water, called *Marsteenboen*. There are various good anchorages between the islands which line the coast, in from 15 to 50 fathoms water, particularly at Kalv-Oe, and the S.E. part of Great Sartor-Oe. The pilots commonly take you into small coves, or harbours, where they fasten the vessels to the rocks. Sartor-Oe is a large island, running in a N. ¼ westerly direction from Kors Fiord, full 17 miles. On its outer or western side are innumerable islands and *rocks*, forming passages and harbours for shipping, with deep water all round; but many of them are of too intricate a nature for strangers to attempt. Within, or to the eastward of Sartor-Oe, are the

customary channels to Bergen, which are various, as they pass between the islands Leer, Tos, Bior, and Little Sartor; but having arrived so far as the N.E. part of this latter island, the channel opens to the eastward and runs directly up to Bergen.

We have here noticed the customary entrances to Bergen from the southward. To the northward of Sartor-Oe are various other passages, which run into the Guilte Fiord, and are too numerous to describe; suffice it to say, that deep water surrounds almost every island, and there are channels between them all; but the principal great northern passages are through Feye Oosen and Feye Fiord; the former is situated in latitude $60^{\circ} 44'$, and runs in between Flissa and Feye-Oe, being $1\frac{1}{2}$ mile wide, and clear of danger, if we except the Klevesk Rock, which lies on the southern side of its entrance, and must have a berth.

The Feye Fiord is about 7 miles to the northward of the Feye Oosen, and is a wide extensive channel. Its entrance is to the northward of Holmengraa. Having entered this channel, and passed to the eastward of Holmengraa, your course will be south, a little inclined to the east, until you reach the Guilte Fiord; whence, passing to the eastward of Great Sartor-Oe, and north-eastward of Little Sartor-Oe, you will get into the direct channel to Bergen.

There is indeed another passage to the eastward of Ask-Oe through Herle-Oe Fiord, called the North-Lee, which leads also to the anchorage of Bergen; this will readily be seen by inspecting the chart, where a particular plan is given of the various entrances to Bergen, correctly pointed out, according to the late Danish surveys, and published by the proprietor of this work.

TIDES.—Between Holmengraa and Bergen the flood runs generally to the southward, and ebb to the northward; but in the Leede, to the southward of Bergen, the flood runs to the northward, and ebb to the southward; off the land, the ebb, in good weather, will commonly set right across the islands; but the currents are always dependent on the prevailing winds, and are much stronger towards the south than the north.

The tides rise and fall about 4, 5, and 6 feet; but to the southward about the Naze, the rise is less, and materially influenced by the weather in the North Sea.

The land from the entrance of the Feye Fiord runs in a N.N.-easterly direction, and continues encumbered on its frontage with a similar assemblage of rocks and rocky islands: but within the latitude of 61° and 62° , these are mostly of smaller size and dimensions, and interspersed with numerous *shoals* and *rocks* under water, stretching out full 5 leagues from the main; vessels, therefore, passing these, and bound northward, should give this part a wide berth; for, though these are mostly steep-to, and have deep channels between them, there are no directions we are able to communicate which could be sufficient to enable the mariner to navigate their intricacies with safety.

A little to the northward of the Feye Fiord, is a wide channel, called the Fens Fiord; and beyond that is another, commonly named Sogne Soen, running in E.N.E. $\frac{1}{4}$ E. At its entrance are the little Svalene Islands, passable on either side. To the northward are the Udvoer Isles, which lie in latitude $61^{\circ} 2'$, and longitude $4^{\circ} 32'$ east; these are the outermost islands at this part, and may be passed near to with safety. About 15 miles farther on are the Bue Islands; W.N.W. $\frac{1}{4}$ N. from which, distant $3\frac{1}{2}$ miles, is a *shoal*, called the *Wærgrund*. About 4 leagues beyond the Bue Isles, is the entrance to Stav Fiord. Between these, the space is covered with *rocks* and shoal water, which must be carefully navigated. Scattered *rocks* continue to line the shore, so far as 62° of latitude, near which is the entrance to Bremanger Fiord; having, on its southern side, the triangular Island of Bremanger, and, to the northward, the Isle of Waags; this latter island has a rocky *shoal* stretching out from its western side, and forms the southern boundary of the channel into Ulus Waag, within which are several good anchorages, but rendered dangerous by the *rocks* about it.

The Stadt Land is a long and broad peninsula, extending from the main, in a N. by W. direction, its N.W. point being in latitude $62^{\circ} 11' 30''$ north, and longitude $5^{\circ} 7' 30''$ east. This forms the eastern part of the Ulus Waag, and the western boundary of Vandelus Fiord. Numerous large islands now intervene, between which are the entrances to Rovde Fiord; and to the north-eastward is the Rond-Oe, upon the northern point of which is a lighthouse, in latitude $62^{\circ} 25'$ north, and longitude $5^{\circ} 35'$ east, bearing a fixed light, from the 15th August to the 30th April: this is the northern-

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most of the group, named the Flaewaers Oerne, consisting of the islands Scorpa, Neerlands, Moglebust, Boeland, Remoe, and Rond-Oe, with various lesser islets. There are passages between most of them, leading to the Breed Sund, and also to various good anchorages; but the navigation of these is too difficult for strangers.

At Valderhoug, in Breedt Sound, is a fixed harbour-light, 40 feet in height, and lighted between the 15th of August and the 30th of April, every night, from sun-set to sun-rise.

The Breed Sund is $2\frac{1}{2}$ miles wide at its entrance, between Hareidlandet and God-Oe. The channel then runs, in a circuitous and irregular manner, between the main land and a cluster of islands, generally named Romsdals Oerne. These islands are mostly surrounded, on their north-western sides, by extensive *rocky shoals*. There are channels between most of them, leading to the anchorages in Harroe Fiord, and the town of Molde; also through the northern channel, called Lyngvaer Fiord, and Boe Sund: at this latter place the anchorage is good, and convenient for sailing out to the northward.

From the entrance to Lyngvaer Fiord, the land runs E. $\frac{1}{2}$ N., and is encumbered with a continuation of these *rocky shoals*, obliging the navigator to give it a good berth in passing. About 13 miles from Boe Sund, is the entrance of the southernmost channel to Christian Sund.

CHRISTIAN SUND is singularly situated, and chiefly built, irregularly, upon three rocky islands, which enclose a good and secure harbour, with a wharf and other necessary accommodations. It is in latitude $63^{\circ} 7' 26''$ north, and longitude $7^{\circ} 42' 10''$ east from Greenwich.

Vessels sailing from Boe Sund for Christian Sund, will steer E. by N. and E. $\frac{1}{2}$ S., giving the land a berth of $1\frac{1}{2}$ mile, in which route they will have from 35 to 45 fathoms; and leaving Quitholmen on the starboard side, they will pass to the eastward of Fuglen and Fuglenerne, a little island, with a *rocky shoal* stretching from it. At 2 miles E.N.E. from Quitholmen, is the *Fognan Rock*, under water; you will pass on either side of this danger. About $1\frac{1}{2}$ mile farther, you will meet with the *Ballerman Shoal*; between which and the *Tromskier*, a rock above water, you will have 8, 10, and 12 fathoms. The channel is then open, and free from any hidden danger, all the way to the harbour of Christian Sund.

Vessels coming from seaward, frequently go to the northward of the Fuglen and Ballerman, and along the southern side of the rocky bank of Myholmene, their course in being S.E. by E., taking care not to approach Quitholmen within 4 miles, when you have it between the bearings of S.E. and S.S.E.; after which, endeavour to pass it at the distance of 2 miles. Continue on an E.S.E. course 4 miles farther; and when abreast of Uhrvaagen, steer E. $\frac{1}{2}$ N.; this will carry them past the Braka Rock, at the east point of Myholmene; then steer E.N.E. $\frac{1}{2}$ E., about 4 miles, to the eastern end of the Bank of Ravnene, your depth being 40, 50, and 60 fathoms throughout. Having reached the northern part of Bremsnø, turn round in the direction of the land, taking care to give the rock Sveggen a proper berth; and when you get the channel between Bremsnø and Kirkelandet open, steer right in for Christian Sund. There is a good passage between the two banks Myholmene and Ravnene; and being without any leading-marks, it is considered hazardous, and therefore seldom adopted.

The usual and most common entrance to Christian Sund, is to the northward of the Ravnene Shoal, in which route you will bring the western part of Kirkelandet to bear S.E. by S., and pass midway between Sjelbrøen and Kraaka Rocks on one side, and the Trefflosen and Rundskjellengen Rocks on the other; these are always visible above water. Having cleared these, you will have 55, 60, 50, 45, and 35 fathoms water, the latter depth being near the entrance to Christian Sund. On the northern side of this passage you will see the *Grib Oerne*, a cluster of barren rocky islands, which are dangerous to approach too near. On the north-eastern side of these islands is the Grib Hoelen, or southern entrance to the channel of Drontheim.

LIGHTS OF CHRISTIAN SUND.—The Marine Department of the Royal Norwegian Government has given the following particulars and instructions respecting the lights on Quitholmen and Staveness, which were first lighted on the 1st September, 1842.

Quitholmen light is a revolving one, which every minute throws out a light, of 10 to 12 seconds' duration, and is followed by an eclipse, though not a total one. The said

light, under ordinary circumstances, when the eye is 10 to 15 feet above the level of the sea, may be seen at the distance of 18 to 20 nautical miles, in the direction of S.S.W. $\frac{1}{2}$ W., through west, north, and east, up to S.S.E. $\frac{1}{2}$ E., and is situated in latitude $63^{\circ} 1' 15''$ north, and longitude $7^{\circ} 12' 16''$ east of Greenwich; its altitude above the level of the sea being 180 feet. The light-tower is painted white. Coming from the west, at night-time, with the intention to enter the Fugel Channel (Fugleledit), the light must be brought to bear E.S.E. $\frac{1}{2}$ E.; after which, a ship may steer for the same, until within about $\frac{1}{2}$ a league, when the course must be altered to E. $\frac{1}{2}$ N., by which she will pass at about 2 or 3 cables' length outside the Fognan.

In case the Fognan Fall should be straight a-head, it would be well to keep it on the starboard side; but there is no danger in passing the same on either side; however, if the course is kept E. $\frac{1}{2}$ N., as directed, the noise of the waterfall will, of itself, convince any one that he must be near it; though, for better security, it is to be observed, that the light on Quitholmen is then S.W. by W. $\frac{1}{2}$ W. From this point the course lies east and E. $\frac{1}{2}$ N. for $1\frac{1}{2}$ league, till the Braka Falls are passed; when the course is altered to E.N.E. $\frac{1}{2}$ E., till the light of Staveness is in sight. With the intention to pass round the Fugel into the channel, a ship ought not to come nearer the light of Quitholmen than 4 to 6 miles, or before it bears S. 21° E., when she may steer straight up to it; but not if the Quitholmen light should bear more southerly than S. 2° E., in which case, it would bring her too near the Olan Rock.

Staveness light is a fixed one, which, under the above-mentioned circumstances, may be seen at 3 leagues distance, in all directions of the compass, from N.W. by W. $\frac{1}{2}$ W., through north and east to S.E. It is situate in latitude $63^{\circ} 7'$ north, and longitude $7^{\circ} 39' 6''$ east of Greenwich. Its altitude above the level of the sea is 63 feet; and, in order to serve as a land-mark for ships intending to enter the Trefloss, the buildings are painted with a bright colour. Ships bound to Christian Sund must, as soon as the light of Staveness is in sight, alter their course from east to south, and steer the same, till the light of Staveness bears S.S.E. $\frac{1}{2}$ E., and till arrived at the side, where the light is visible, when the course is to be altered to S.E. A vessel will pass between Smorvigness and the shore; and as soon as the sound is open, an easterly course is kept into the harbour, where there is good anchorage, in 8 to 12 fathoms water. Should the ship have drifted past the harbour, she may, by the assistance of the light of Staveness, put into Trefloss, as by steering straight for it, as soon as it bears S.E. $\frac{1}{2}$ E., she will run clear of all rocks. Bound for Christian Sund, the course is as above described, as soon as a ship has neared the lights within $\frac{1}{2}$ of a league.

Both lights burn from the 15th of August to the 30th of April; and are lighted from Easter to Michaelmas one hour, and from Michaelmas to Easter $\frac{1}{2}$ an hour after sunset, to sun-rise. The variation is 18° west, and the foregoing are compass bearings.

DRONTHEIM, or TRONDHEIM, is a large and populous town, being the capital of the province in which it is situated. It stands on the south bank of an arm of the sea, by which it is surrounded, and is extremely well calculated to carry on an extensive commerce. The chief exports are copper, iron, timber, and fish; the imports are corn, wine, cloths, groceries, &c.

The Grib Hoelen, or southern entrance to the channel of Drontheim, is in latitude $63^{\circ} 15' 30''$ north. In running in, you must leave the Grib Oerne, before-mentioned, on the starboard side, and the Soelveret Islands and Rocks, on which is a beacon, on your port or larboard; having passed which, there is a *dangerous rock*, called *Soelvers-boen*, almost in mid-channel; you may pass on either side of this danger, but it will be most prudent to borrow on the starboard shore. From abreast of this rock, your course up the Drontheim Leede, or Channel, will be nearly east, so far as the island Edd, or Edd-Oe; then steer E. by N. $\frac{1}{2}$ N., so far as Wæer-Oe. An east course will take you to Hemskael-Oe, where the channel is narrowed by several islands; and from thence you will sail E. $\frac{1}{2}$ N. to the islands of Lexen, behind which vessels commonly anchor. An E. by N. direction will carry you from the Lexen Islands to Agnoes Flua, where the Drontheim Leede opens, and turns southerly towards the town of Drontheim.

When proceeding from Christian Sund, or the Grib Hoelen Channel, to Drontheim, there are 4 fixed lights to be passed in the channel going up, and lighted from the 15th of August to the 30th of April, every night, from sun-set to sun-rise. The first is Tyrhoug light, at the east end of Eddo Island, 35 feet high, to be passed on the port or larboard side. The second is at Tonningen, 24 miles eastward of Eddo; it is 35 feet

high, and must also be left on the port or larboard side going up. The third is at Agdaness Point, 20 miles eastward of Tonningen; the light is 113 feet high, and must be left on the starboard side. In rounding this light, the course of the channel changes to the southward, running towards Drontheim. The fourth is the harbour-light of Monkholmen, 43 feet high; it lies 21 miles south-eastward of Agdaness Point, and is the guide to the harbour of Drontheim.

The Ramsøe Fiord, or northern entrance to Drontheim, is in latitude $63^{\circ} 30'$ north, and runs in to the eastward of the island of Smølen. This island is surrounded with rocks, both above and under water, particularly at its S.W. and north-western parts; and must always have a wide berth, both in entering the Grib Hoelen, and also the Ramsøe Fiord. The rocks of Soelværet, in the former, have been noticed already. Two rocky banks, at the southern entrance of Ramsøe Fiord, are distant 9 miles from the main body of Smølen, and very dangerous, having 50 and 100 fathoms close to them. There is also the *Grib Tarren*, or *Nattergalene*, which lies to the westward, distant 15 miles from the land, and equally in the way of both channels. On the south-eastern part of this is a rock, with only 9 feet water, while to the north-westward are from 5 to 7 fathoms, and deep water all round. The shallowest rock lies N.N.W. from Grib Oerne, distant 12 miles; and from the outermost, or northern point of the Smølen Banks, nearly W.S.W., distant 17 miles. Great care must be taken to avoid this danger, which, in stormy weather, will readily show itself by the breakers over it. You will pass on either side of it, the water being unfathomably deep.

In sailing into the Ramsøe Fiord, you must avoid the *Geissingsboan Rock*, which lies at the entrance, steering to the eastward of it: and abreast of the N.W. point of Smølen, is the *Midfordboan*, another dangerous rock, lying nearly in the middle of the channel; pass this also on the eastern side, and the Svartskiar Rock on the western. Steer on about S. $\frac{1}{2}$ E. for the Baasset Field, and this direction will clear the Ramsøe-boan Rock. Having reached thus far, you will open the Drontheim Leede, and may proceed mid-channel along the southern shores of Hitteren Island, toward Hemskjæl-Oe and the Lexen Islands, as before directed.

There are several other channels leading to Drontheim, and running in to the northward of Hitteren, such as the Froy Fiorden, between Hitteren and Froyen; the Suul's Fiord, to the northward of Froyen; the Giesing Bogen; and numerous other passages through the Froe and Halten Islands, conducting you to the Froe Havet, or Sea; but these are so complicated, and studded with rocks and islands, that any description we could give would be useless to the mariner: he is, therefore, referred to the chart, where the channels are clearly delineated, and the tracts through the various channels accurately shown: but no one should attempt the navigation of this, or any other port in Norway, without having the assistance of a pilot.

The Board of Admiralty at Stockholm has given notice, that a fixed light has been established on the island of Praestoe, in the Gulf of Folden (Province of Drontheim), situated in latitude $64^{\circ} 27' 26''$ north, and longitude $11^{\circ} 8'$ east. The light is elevated 33 feet above the level of the sea, and is visible at the distance of 10 miles. It will be lighted every night, between the 15th of August and the 30th of April.

Vessels bound to Naerøe Sound, on leaving the Gulf of Folden, are to observe, that the strongest glare of light is seen when it bears E.N.E., easterly; and that by steering for the light on this bearing, they will avoid the dangers on each side of the channel south of Praestoe; and they are cautioned not to stand so far to the eastward, as to lose sight of the light. As soon as they arrive at $\frac{1}{2}$ of a league from Praestoe, they should steer N.N.E., till it bears east, when a N.E. course will carry them up to Naerøe Sound.

TIDES.—The flood sets generally N.E., and the ebb S.W.; but with strong westerly winds, the current sets continually north and N.E., both with flood and ebb. On the contrary, with an easterly wind, the current sets constantly to the south-westward, but is seldom so strong. There is, apparently, little or no tide.

GENERAL REMARK.—It is observable, that although Norway lies so far to the northward, yet the havens are seldom entirely frozen up, and the outer part of them, never; therefore, vessels can enter these ports at all times in safety. Drift ice is rarely to be seen; for it can only be, in very severe winters, when the ice, drifting from the Cattegat and the more eastern coasts of Norway, can possibly drive against the land

at the entrance of Christian Sund, or a little more to the west; and then it will happen only at the latter end of winter—in February and March; but to the westward of the Naze, few instances are recorded of the ice having been a hindrance to the navigation of any of the harbours that lie nearest to the open sea.

GENERAL OBSERVATIONS *and* DIRECTIONS *for sailing over the* NORTH SEA.

THE BANKS in the NORTH SEA are large portions of ground, somewhat shoaler, in general, than the parts which surround them; and their depths, when carefully observed, often tend to inform the mariner, when doubtful of his situation. They are of irregular and undefined shapes, and commonly known by the names of the Brown Bank, the Broad Fourteens, the Wells Bank, the White Bank, the Dogger Bank, the Great and Little Fisher's Bank, the Jutland Bank or Reef, the Long Forties, and other lesser banks. These are neither dangerous nor steep-to, but generally rise by a gradual elevation; and their boundaries will best be understood by the chart. The current over these banks is visibly affected by the winds, but in general inclines towards the N.E., a circumstance particularly necessary to be attended to, as calculated to set the mariner, bound from the British shores toward the opposite coast, beyond his reckoning, and perhaps thereby endangering his vessel, by coming too soon upon these shoals which so generally line the shore. Those, therefore, who sail from the westward, in order to make any part of the coast between the Texel and the Scaw, should look out for land in time; for it is very common in making it to find the distance from 20 to 30 miles less, than when sailing the contrary way in making the British coast. This particularly happens with south-westerly winds, which, causing a constant current to the east and north-eastward, generally sets across the Jutland Reef and the south side of the Sleeve towards the Scaw Point; or varying its direction with the wind, bends towards the coast of Norway.

It is, therefore, particularly necessary to be cautious, that the northern current does not drive the ship a-head of her reckoning to the northward of the Jutts Reef, especially with south and S.S.-easterly winds.

The current along shore, above Bovenbergen, sets, with westerly winds, about 2 miles an hour, and with strong S.S.W. gales, more than 3 miles.

A very deceiving current likewise sets between the Naze of Norway and the Orkney Islands, the knowledge of which is, to the mariner, the more important, some of these islands being very low, and generally obscured from view by fog and mist in summer, and annoyed by the most powerful gales in winter.

This current takes its course with the wind, particularly when it blows from the southward or northward; but generally it runs strongest to the northward. As the wind continues, the current increases, and sometimes runs more than 2 knots midway between the Naze and Orkneys, after long-continued south-westerly winds.

Easterly or westerly winds, blowing athwart this current, sometimes render it almost insensible in the offing; and, within 3 or 4 leagues of the islands, the tides take that regular course, which they keep between the Orkney and Shetland Islands.

It has frequently been observed, in sailing from the Naze to Fair Island, the distance has sometimes appeared from 5 to 10 leagues shorter than the distance shown on the chart, which must be occasioned by currents setting to the north and to the west, chiefly when the wind blows from the south or from the east. Between the Jutland Reef and the coast of Norway, the current generally sets to the westward, even with westerly winds, and, at the same time, the current on the Jutland coast sets eastward towards the Scaw.

There is also a current with northerly and north-westerly winds, which runs southward by the coast of Norway, across the Jutland Reef, and along the coast of Jutland towards Heligoland. This current, when it blows hard, runs at the rate of $1\frac{1}{2}$ or 2 knots, and requires particular attention by those who are navigating in these parts, during such gales.

A ship bound from England to the Cattegat, with the wind in the N.W. quarter, should endeavour to get well to the northward, before she bears up for the Sleeve, in order to counteract the effects of this current. The same precaution is necessary when bound from the Cattegat to England with those winds; by keeping on the Norway

coast, you will have the westerly current in your favour, until you get so far westward as the Naze, provided you do not stand so far southward as the edge of the Jutland Reef. After passing the Naze, you will soon feel the effects of the current, and must judge, from the direction and force of the wind, whether it is prudent to proceed.

On approaching the coast of Norfolk, should you get on the Wells Bank, the ridges near its western edge will indicate your proximity to the Leman and Ower; but if you are farther to the southward, and get 25 to 26 fathoms, you will be in the deep-water channel, and should be very careful, when standing to the westward, until you get to the southward of Smith's Knoll. Between Lowestoff and Aldborough, you may approach the shore to any convenient depth, the soundings being regular, and, therefore, this is considered the best part to make the land.

But large ships, during winter, had better endeavour to make the land about Flamborough Head. This bears from the Naze of Norway W.S.W., a little westerly, distant 110 leagues. They then may shape a course so as to clear the Leman and Ower, or sail within the sands, through Hasborough Gat.

In winter, the mariner should avoid going to the southward of Bovenbergen, till he gets well to the westward, that he may have it in his power, in cases of emergency, to bear-up for the Sleeve, Norway, or the Sound.

Turning out of the Sleeve with westerly winds, you should keep near the Norway coast, and not stand to the southward of the edge of the Jutland Reef, as the current always sets to the westward on that coast, but does not extend far from the land. Be particularly careful not to stand to the southward of Bovenbergen with a N.W. wind, for fear of being embayed, and prevented from getting out.

A ship of the line, under lower sails, on the starboard tack, with the wind at N.W. by N. in the S.E. current, here would be looking right for England, and going direct for Holland; for by allowing two points westerly variation, the set of the current and her lee-way, she will not make better than a south course; therefore, keep the Sleeve open, and the ship will be safe.

It is strongly recommended to all commanders coming from the Cattogat in the winter time, to make the land, if they possibly can, on the Yorkshire coast; then they will avoid the danger of coming in at the back of Yarmouth Sands, and have a good departure to shape a course clear of the Leman and Ower, which ships of the line must do, as it would be dangerous for them to take the coasters' track. Small vessels may keep the coast.

Commanders having the charge of convoy ships bound to the Cattogat, should be careful to get well to the northward, before making much easting, for fear of being caught with a strong N.W. gale.

TABLE OF MAGNETIC BEARINGS AND DISTANCES.

| | | Compass Bearings. | Distances in Nautic Miles. |
|--|--|----------------------------------|----------------------------|
| From the North Foreland Lighthouse to the Goodwin Light-vessel | | S.E. by S. | 6 |
| Galloper ditto | | N.E. by E. $\frac{1}{4}$ E. | 28 $\frac{1}{2}$ • |
| Calais | | S. $\frac{3}{4}$ E. | 29 |
| Dunkirk | | S.E. $\frac{1}{4}$ S. | 40 |
| Ostend | | S.E. by E. $\frac{1}{4}$ E. | 56 |
| Walcheren W. Kapelle | | E.S.E. $\frac{1}{4}$ E. | 75 |
| Goeree Gat | | E. $\frac{1}{4}$ S. | 92 |
| S. Entrance of the Texel | | E.N.E. $\frac{3}{4}$ E. ... | 150 |
| Orfordness to Calais..... | | S. by W. $\frac{1}{4}$ W. | 68 |
| Dunkirk | | S. $\frac{1}{4}$ E. | 69 |
| Ostend | | S.S.E. $\frac{1}{4}$ S. | 72 |
| West Kapelle | | S.E. $\frac{1}{4}$ S. | 78 |
| Goeree Gat | | S.E. by E. | 86 |
| the South Entrance of the Texel..... | | East | 121 |
| the Naze of Norway | | N.E. $\frac{1}{4}$ E. | 400 |
| Lowestoff to Dunkirk | | S. $\frac{3}{4}$ W. | 88 |
| Ostend | | S. $\frac{1}{4}$ E. | 84 |
| W. Kapelle | | S.S.E. | 85 |
| Goeree Gat | | S.E. $\frac{1}{4}$ S. | 87 |

[NORTH SEA.]

D D

Compass Bearings. Distances in
Nautic Miles.

| | | |
|--|----------------------------------|------------------|
| From <i>Lowestoff</i> to the South Entrance of the <i>Texel</i> | E. by S..... | 108 |
| <i>Heligoland</i> | East | 242 |
| <i>Bovenbergen</i> | E.N.E. | 326 |
| the <i>Naze of Norway</i> | N.E. $\frac{1}{4}$ E.... | 375 |
| <i>Spurn Head</i> , the <i>Humber</i> , to the S. Entrance of the <i>Texel</i> | S.E. $\frac{1}{4}$ E..... | 164 |
| <i>Borkum Light</i> | E.S.E. $\frac{1}{4}$ E.... | 228 |
| <i>Heligoland</i> | E.S.E. $\frac{1}{4}$ E.... | 275 |
| <i>Bovenbergen</i> | E. by N..... | 327 |
| the <i>Naze of Norway</i> | N.E. by E. $\frac{1}{4}$ E. | 345 |
| <i>Flamborough Head</i> to the S. Entrance of the <i>Texel</i> | S.E. $\frac{1}{4}$ S. | 181 |
| <i>Heligoland</i> | E.S.E. | 280 |
| <i>Bovenbergen</i> | E. $\frac{1}{4}$ N. | 314 |
| the <i>Naze of Norway</i> | E.N.E. $\frac{1}{4}$ E. | 331 |
| <i>Skudesness Light</i> | N.E. by E..... | 350 |
| <i>Tynemouth, Newcastle</i> , to the S. Entrance of the <i>Texel</i> ... | S.E. $\frac{1}{4}$ S..... | 243 |
| <i>Heligoland</i> | S.E. by E. | 325 |
| <i>Bovenbergen</i> | E. $\frac{1}{4}$ S. | 332 |
| the <i>Naze of Norway</i> | E. $\frac{1}{4}$ N. | 334 |
| <i>Berwick to Heligoland</i> | S.E. $\frac{1}{4}$ E. | 355 |
| <i>Bovenbergen</i> | E.S.E. $\frac{1}{4}$ E. | 338 |
| the <i>Naze of Norway</i> | E. $\frac{1}{4}$ S. | 325 |
| <i>May Island Light</i> to <i>Heligoland</i> | S.E. | 380 |
| the <i>Naze of Norway</i> | E. $\frac{1}{4}$ S. | 330 |
| <i>Skudesness Light</i> | E. by N. | 305 |
| <i>Bell Rock to Buchanness</i> | N.E. $\frac{1}{4}$ N. | 67 |
| <i>St. Abi's Head</i> | S. by W. | 32 $\frac{1}{2}$ |
| <i>Heligoland</i> | S.E. | 378 |
| South Entrance of the <i>Texel</i> | S.S.E. | 322 |
| <i>Buchan Ness</i> to the Entrance of the <i>Texel</i> | S. by E. $\frac{1}{4}$ E. ... | 348 |
| <i>Heligoland</i> | S.E. by S. | 380 |
| the <i>Naze of Norway</i> | E.S.E. $\frac{1}{4}$ E. | 286 |
| <i>Duncansby Head</i> to <i>Heligoland</i> | S.S.E. $\frac{1}{4}$ E. | 454 |
| the <i>Naze of Norway</i> | S.E. by E..... | 327 |
| <i>Skudesness Light</i> | E.S.E. $\frac{1}{4}$ E..... | 257 |
| the <i>Kors Fiord</i> , Entrance to <i>Bergen</i> | E. $\frac{1}{4}$ S. | 260 |
| <i>Boe Sund</i> , Entrance of <i>Christian Sund</i> | E. by N. $\frac{1}{4}$ N.... | 394 |
| <i>Rams-Oe Fiord</i> the Northern En- trance to <i>Dronthiem</i> | E. by N. $\frac{1}{4}$ N.... | 432 |
| the <i>Naze of Norway</i> to the <i>Scaw</i> | S.E. by E. $\frac{1}{4}$ E. | 115 |
| <i>Dennis Ness</i> to the <i>Naze of Norway</i> | S.E. $\frac{1}{4}$ E. | 310 |
| to <i>Skudesness</i> | S.E. by E. $\frac{1}{4}$ E. | 238 |
| <i>Dennis Ness</i> to <i>Fair Island</i> | East | 23 |
| <i>Kors Fiord</i> | E. by S. $\frac{1}{4}$ S. ... | 229 |
| <i>Boe Sund</i> | E.N.E. $\frac{1}{4}$ E. | 348 |
| <i>Rams-Oe Fiord</i> | E.N.E. $\frac{1}{4}$ E. | 388 |
| <i>Sumbro' Head Light</i> to <i>Fair Island</i> | S.S.W. $\frac{1}{4}$ W.... | 21 |
| the <i>Naze of Norway</i> | S.E. $\frac{1}{4}$ S. | 280 |
| <i>Kors Fiord</i> | E.S.E. $\frac{1}{4}$ E. | 188 |
| <i>Boe Sund</i> | E.N.E. $\frac{1}{4}$ E. | 304 |
| <i>Rams-Oe Fiord</i> | E.N.E. $\frac{1}{4}$ E. | 346 |
| <i>Hangcliff</i> , or <i>Noss Head</i> , to <i>Heligoland</i> | S. by E. $\frac{1}{4}$ E. ... | 450 |
| the <i>Naze of Norway</i> | S.E. $\frac{1}{4}$ S. | 282 |
| <i>Skudesness Light</i> | S.E. $\frac{1}{4}$ E. | 200 |
| <i>Kors Fiord</i> | E.S.E. $\frac{1}{4}$ S. | 180 |
| <i>Boe Sund</i> | E. by N. | 292 |
| <i>Rams-Oe Fiord</i> | E. by N. | 336 |
| <i>Lambaness</i> to the <i>Naze of Norway</i> | S.S.E. $\frac{1}{4}$ E. | 294 |
| <i>Kors Fiord</i> | S.E. $\frac{1}{4}$ E. | 175 |
| <i>Boe Sund</i> | E. $\frac{1}{4}$ N. | 270 |
| <i>Rams-Oe Fiord</i> | E. $\frac{1}{4}$ N. | 312 |

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| Commander Becher's Pendulum Artificial Horizon, fitted to any Brass Sextant of modern make | 4 | 14 | 6 „ | 5 | 5 | 0 |
| Burt's Buoy and Knipper | 1 | 10 | 0 each. | | | |
| Massey's Log, improved..... | 4 | 10 | 0 each. | | | |
| —Sounding Machine, improved | 4 | 0 | 0 each. | | | |
| Cases of Drawing Instruments for Geometrical, Trigonometrical, Nautical, or Mathematical Purposes | 0 | 5 | 6 to 5 | 5 | 5 | 0 |
| Ditto, flat, adapted to Surveyors, Engineers, and Draftsmen in general | 1 | 11 | 6 „ | 10 | 10 | 0 |
| Proportional Compasses..... | 1 | 10 | 0 „ | 2 | 0 | 0 |
| Triangular Compasses | 1 | 1 | 0 „ | 1 | 11 | 6 |
| Portable Compasses for the Waistcoat Pocket, including Ink-point and Pencil. | 1 | 12 | 0 „ | 2 | 2 | 0 |

* Where may be had, Gratis, an extensive Catalogue of Charts and Nautical Works,
being Parts I. & II.

CATALOGUE OF NAUTICAL AND MATHEMATICAL INSTRUMENTS—CONTINUED.

| | £ s. d. | £ s. d. |
|--|-----------------|---------|
| A Pair of Compasses or Dividers, from 7 to 9 inches, with one or two Legs; very useful to Persons desirous of Drawing Patterns Geometrically | various Prices | |
| Dividers, 4 inches to 9 inches | 0 1 4 to | 0 2 6 |
| Ditto, better quality, 4 inches to 9 inches | 0 1 8 „ | 0 5 6 |
| Ditto, with a Socket or Sheath | 0 3 0 „ | 0 4 6 |
| Drawing Pens | 0 1 6 „ | 0 4 0 |
| Ditto, better | 0 2 9 „ | 0 3 6 |
| Ditto, best, for Red or Black Ink | 0 3 6 „ | 0 5 0 |
| Ditto, Steel Pens | 0 4 6 „ | 0 10 6 |
| Bow Pens and Pencil Bows | 0 3 6 „ | 0 7 6 |
| Dotting Wheel Pens | 0 3 0 „ | 0 7 6 |
| Camera Lucidas | 1 11 6 „ | 2 2 0 |
| Obscuras | 0 7 6 „ | 2 12 6 |
| Calotype Cameras, for taking Photographic Landscapes and Portraits, with three Paper-holders, &c. | 3 3 0 „ | 5 5 0 |
| Japanned Speaking Trumpets | 0 2 6 „ | 0 4 0 |
| Brass Ditto | 0 8 6 „ | 0 12 6 |
| Marine Barometers | 2 12 6 „ | 4 14 6 |
| Pediment ditto, for House | 1 15 0 „ | 4 4 0 |
| Wheel Barometers, for Hall, &c. | 2 12 6 „ | 5 15 6 |
| Adie's (original) Sympiesometers | 4 4 0 each. | |
| Cummir's Patent Mineral Ditto | 4 10 0 to | 6 0 0 |
| Other Sympiesometers | 3 3 0 „ | 3 13 6 |
| Thermometers for Hothouse, Greenhouse, Brewing, various Experiments, or Common Air | 0 3 6 „ | 1 11 6 |
| Thermometers for taking Soundings, and Medical Purposes | 0 6 6 „ | 2 2 0 |
| Storm Glasses, or Prognosticators | 0 7 6 and | 0 9 0 |
| Horse-Shoe and Artificial Magnets for Rheumatism, &c. | 1 3 0 to | 1 11 6 |
| Bar and Compound Magnets for Experiments and touching Compasses, &c. | 3 3 0 „ | 4 4 0 |
| Best Plain Parallel Rules | 0 1 6 „ | 0 14 0 |
| Ditto, with double Bars or Rollers | various Prices | |
| Thomson's Lanar Scale, 2 and 3 feet, and Directions | 1 1 0 to | 1 11 6 |
| Donn's Gunter's Scales, and Directions | 0 4 0 „ | 0 5 0 |
| Robertson's Gunter's Scales | 0 4 0 each. | |
| Gunter's Scales | 0 2 6 to | 0 3 6 |
| Two-feet Sliding Gunters | 0 6 6 „ | 0 7 6 |
| Two-feet four-fold Cordage Rules, with and without Gun-shot Tables | 0 2 6 and | 0 2 9 |
| Two-feet four-fold best flat Cordage Rules, with Wood, Brass, or Ivory Slides | 0 5 0 to | 0 8 6 |
| The Improved Mast-maker's Rule, as described in a Work called the "Art of Mast-making" | 0 8 0 „ | 0 10 0 |
| One-foot four-fold Rules, with the English, Hamburgh, Rhyndland, and Spanish Foot and Inches, Wood or Ivory | 0 3 6 „ | 0 5 0 |
| Ditto, containing the Dutch, Swedish, French, and Portuguese Foot and Inches, Wood or Ivory | 0 3 6 „ | 0 5 0 |
| Tape Measures, from 1 Pole to 6 Poles in length, divided common or decimally, for Land Surveying, Measurement of Ships or Timber, &c. | 0 5 6 „ | 0 15 0 |
| Steel Pins, to fasten down Paper flat previous to making a Drawing, each | 0 0 2 „ | 0 0 3 |
| Globes, 1 inch to 3 inches Diameter | 0 1 6 „ | 0 4 0 |
| Pocket Ditto, in Cases | 0 7 6 „ | 2 2 0 |
| Ditto, 9, 10, 12, 15, 18, 20, and 21 inches Diameter | 2 12 6 „ | 22 0 0 |
| Quadrants of Altitude for Celestial and Terrestrial Globes, according to the Diameter of the Globes | 0 1 6 „ | 0 10 6 |
| Time Glasses, from 5 minutes' time to 4 hours | various Prices. | |
| Ditto, common | Ditto. | |
| Log Glasses, 14 seconds' time, and 28 seconds | 0 2 0 to | 0 3 6 |
| Ditto, common | various Prices. | |
| Egg Glasses | Ditto. | |

* * *All kinds of Nautical Instruments cleaned, repaired, and adjusted.*

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